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January, 1923

NEW EXPERIMENTAL DATA ON THE QUESTION OF THE SEAT OF THE ENDOCRINE FUNCTION OF THE TESTICLE.*

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The theory of Bouin and Ancel that the endocrine function of the testicle in mammals is mediated by the interstitial cells, grounded upon the extensive research of these authors, has been supported by Tandler and Grosz, Steinach, Sand and by myself.* But lately several attacks upon this theory have been made, especially by Kohn (1), Benda (2) and Stieve (3), without new experimental data having been added. These authors are of the opinion that only the generative part of the testicle has an endocrine function, the interstitial cells being a trophic organ for the former.

Different experiments performed by myself and my coworkers, *Wagner, Ottow, Bormann* and *Kropman,* during the past two years have enabled us to throw some light on certain aspects of the problem. In the following I will present a short account of the observations we have communicated in different places; some of them have not been previously published.

*The literature is reviewed in my book "Die Pubertätsdrüse und ihre Wirkungen." Berne, 1919.

C.M. 10-26-26

I.

Is a normal internal secretion of the testicle in mammals possible without fully developed interstitial cells? That this is not possible is shown by two of our experiments.

A. On a rabbit (4) (Prot. No. 4) about a month old one entire testicle and half of the second were removed. The animal was observed until the age of 8 months. The penis remained infantile. A small testicular fragment was found. That the

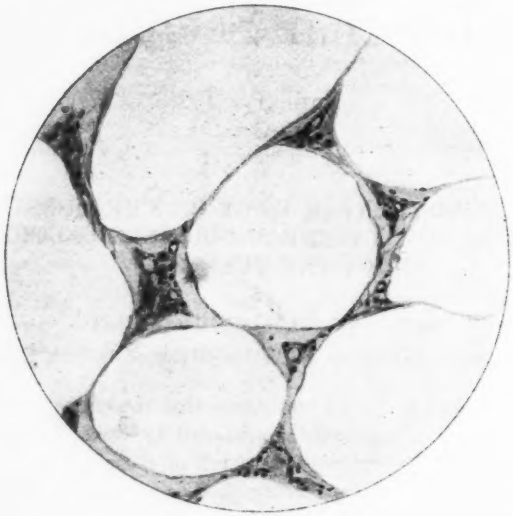

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Fig. 1. Section through testicle of a rabbit 6½ months old, semicastrated at an age of 6 weeks. The animal had a normal penis. Interstitial cells with a large area of protoplasm around the nucleus. Seminal tubules in full spermatogenesis (not drawn). Fixation, Helly; Stain, Hem.-Eos. [All figures from preparations of Dr. Wagner, drawn by Miss L. Lebbert (except Fig. 3, drawn by Dr. Wagner) with the drawing apparatus of Leitz. Obj. Zeiss D. The scale is given in Fig. 6. All figures are reduced one-half.]

eunuchoidism of this animal was not caused by the fact that the quantity of testicular substance was too small, is shown by our numerous experiments on guinea pigs. In these animals extraordinarily small testicular fragments, representing only about 1 per cent of the weight of two normal testicles, were sufficient for the full development of the somatic sexual characters (5). The eunuchoidism in this experiment must have been caused by the underdevelopment of the testicular fragment as

shown by microscopical examination. The seminiferous tubules were somewhat further developed than in an animal of about two months, the diameter being greatly enlarged, and the quantity of cells, likely cells of Sertoli, being increased. Spermatogonia were present. Some tubules were filled with desquamated cells; it seems that these were cells of Sertoli surrounding spermatogonia. The intertubular tissue was richly developed, but consisted chiefly of common connective tissue. As far as interstitial cells

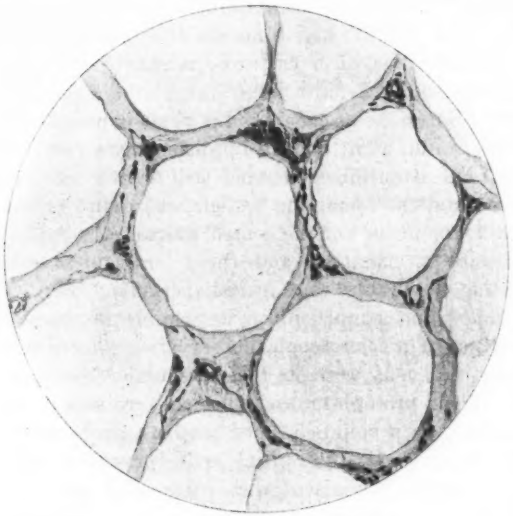

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Fig. 2. Section through testicle of a rabbit 6½ months old, semicastrated at an age of 6 weeks. The animal had the penis of a castrate. The intertubular tissue is rich in connective fibres and spindle shaped nuclei. Interstitial cells with a small area of protoplasm and with a smaller nucleus. Seminal tubules in full spermatogenesis (not drawn) and of the same diameter as in Fig. 1. Fixation and stain, as Fig. 1.

were recognizable they had the infantile form, i. e., a smaller nucleus and a small quantity of protoplasm. In general it was difficult to distinguish them from common connective tissue cells. This observation shows that in the presence of spermatogonia and of cells of Sertoli the internal secretion of the testicle is not possible when the interstitial cells are underdeveloped.

An objection can be made against our conclusion: It may be that the animal in the experiment mentioned remained eunuchoid,

not because the interstitial cells were underdeveloped, but because the spermatogenesis had not proceeded far enough. That this objection is not justified is shown by the following observation (6).

B. On two rabbits about six weeks old we performed, for other experimental purposes, unilateral castration; a third animal of the same litter was kept as a control. It is well known that unilaterally castrated animals have fully developed sexual characters. To our great astonishment one of the semi-castrated animals (Prot. No. 95) had at an age of 6½ months the infantile penis characteristic of a castrate; normally the penis of the rabbit assumes its definite adult form at an age of 3½ to 4 months. No mistake as concerns the penis is possible, the differences between an adult and an infantile organ being very striking. But our astonishment became still greater when the animal was killed and the remaining testicle was found to weigh twice as much as the testicle of the control animal; the epididymis was packed with spermatozoa and the microscopical examination showed that the tubules were in full spermatogenesis. There can be no doubt that eunuchoidism is possible in the presence of spermatozoa. The microscopical observation showed further that the interstitial cells were in this case underdeveloped (figs. 1 and 2). Their protoplasm and nucleus were small. In several places cells with a spindle-shaped nucleus, probably connective cells or "quiescent" interstitial cells, prevailed between the tubules. Only a few places with better developed interstitial cells, like those in the two other animals of this experiment, were present. We see that full spermatogenesis with production of spermatozoa, but in absence of fully developed interstitial cells, was in this case insufficient for the performance of the internal secretion of the testicle.

II.

If it is shown that the testicle cannot perform its endocrine function without fully developed interstitial cells, this does not yet mean that the latter are producing the sexual hormones. Two other possibilities are also to be taken into consideration. First, that these cells are necessary for the production of spermatozoa [Kyrle (7), Kohn (1), Stieve (3) and others] which latter would then be the real producers of the sexual hormones. Second, that the interstitial cells serve as intermediaries between the

generative part producing the hormones and the blood into which the hormones have to enter [Berblinger (8)]. But we were able to show experimentally that neither spermatozoa nor any other generative cells, with the possible exception of cells of Sertoli and spermatogonia, are necessary for the internal secretion of the testicle.

A. That spermatozoa are not necessary for the performance of the internal secretion is shown by the following observation (9). On a rabbit (Prot. No. 49) two months old, horizontal incisions in the testicles were made. On the left side the incisions touched probably only the testicle, on the right side also the ductus epididymidis was sectioned. When the control animal which was born the same day, already showed signs of full puberty, the penis of the operated animal was still in an infantile stage. But at an age of about seven months, after we had thought for some time that the animal would remain eunuchoid, a somewhat accelerated development of the penis began and in the eighth month the penis of the animal was almost wholly like to that of the control. The microscopical examination of the left testicle (fig. 3) showed the tubules evidently entered into spermatogenesis. The tubules were lined with several layers of cells which became mostly desquamated, filling the space inside the tubules. The diameter of the tubules was greatly increased as compared with that in an infantile testicle. It is impossible to say whether the spermatogenesis really began in a normal way, because there were in the tubules no cells which could be designated as spermatogonia or spermatocytes. But even if there was a normal beginning of spermatogenesis, this in all cases was stopped by interference of some other factor. The interstitial cells were well developed like in the testis of the normal control animal (fig. 5). Dr. Wagner found even several mitoses, a phenomenon very rare for interstitial cells. The microscopical examination of the right testis gave somewhat similar results.

This observation leaves no doubt that full development of a sexual character which depends upon the internal secretion of the testis, is possible without any spermatozoön having developed. As to the question whether other stages of spermatogenesis are necessary for the entrance of the testicle into puberal hormonic activity, this observation gives no definite information, as it was

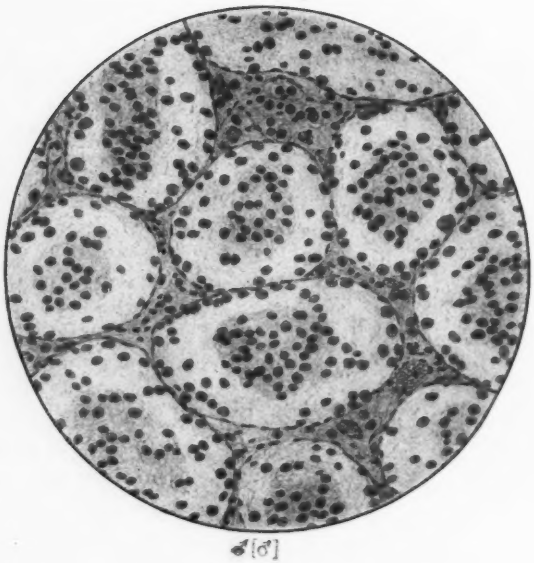

Fig. 3. Section through testicle of a rabbit 8½ months old; horizontal incisions on the testis made at the age of 2 months. Normal penis. Interstitial cells well developed. Seminal tubules in a state of degeneration; desquamation of cells which seem more likely to be cells of Sertoli. Fixation, Bouin; stain, Hem.-Eos.

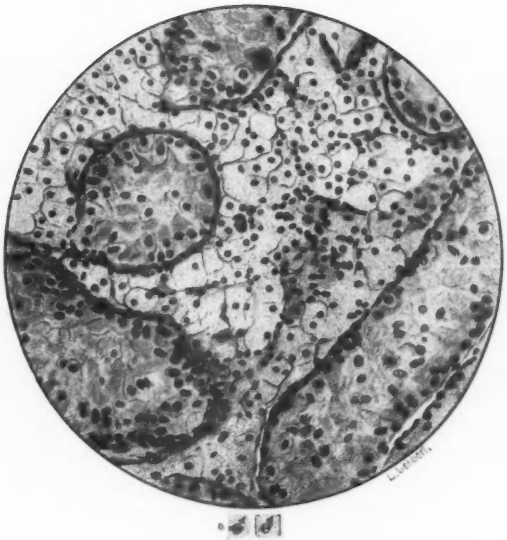

Fig. 4. Section through testicle of a rabbit 8½ months old, horizontal incisions through the testicle and ductus epididymus at the age of 2 months. The animal had the penis of a castrate. Interstitial cells of extraordinary dimensions packed full evidently with fat. Seminal tubules in a state of degeneration; they seem to be less developed than in Fig. 3. Fixation and stain, as Fig. 3.

not possible to make any precise statement as to the character of the desquamated cells.

B. Now I will give an example which shows that full hormonic activity of the testis is possible even in the absence of all stages of spermatogenesis (10). On a guinea pig (Prot. No. 30) about ten days old, partial castration was performed; the left testis was wholly removed and from the right testis only a small fragment from the upper pole was left in the body. When the animal was seen four months after the operation the penis with the intromittent sack and the horny styles was found normally developed. Then the animal was killed. The vesiculae seminales were found normal in every respect as compared with the normal control animal. The testicular fragment was found embedded in the fat tissue covering the upper pole of the testicle of the guinea pig. The fragment was of a reddish brown color, more or less similar to that of the liver. The vascularization of the fragment was very good. The microscopical examination of this fragment showed that all the tubules without any exception were in a state of degeneration. There was only one layer of cells in the tubules, most likely cells of Sertoli and perhaps—I never could state it with certainty—some spermatogonia. The total volume of this fragment was very exactly calculated to be about 20 cc.

This observation seems to show that full hormonic activity is possible even in absence of all the stages of spermatogenesis, i. e., when the tubules by a "regressive development" are brought to a juvenile stage (11).

Against this conclusion one could make two objections:

(1) It may be that after the seminal tubules had remained in a juvenile stage for a certain time, signs of castration would show. But we have observed an animal treated in the same way, for eleven months, without somatic signs of castration appearing. A temporary regeneration of generative tissue as probably occurring in testicular fragments might indeed have interfered and by this the maintenance of the sex characteristics might be explained. But no proof exists that such a regeneration always takes place. Tiedje (12) assumed that there is, after a degeneration of the tubules has taken place, a pause in the endocrine function of the testicle till regeneration occurs; but this is wholly erroneous, since out of a great many cases I only once observed

temporary cessation of the endocrine function of the fragment with following resumption of endocrine activity.

(2) A second possibility would be that the testicle can, indeed, perform its normal hormonic function without the different stages of spermatogenesis being present, but that spermatogenesis is necessary for the development of the interstitial cells to an organ of internal secretion. If we compare the animal

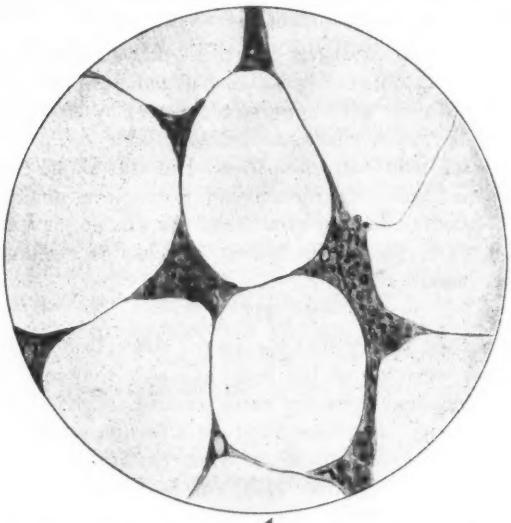

Fig. 5. Section through the testicle of a normal animal of the same litter as Fig. 4. Seminal tubules in full spermatogenesis (not drawn). Normal interstitial cells. Fixation and stain, as Fig. 3.

Fig. 6. Scale of magnification.

No. 4 with No. 30 such an assumption becomes very suggestive. In No. 4 we have infantile tubules and infantile interstitial cells with eunuchoidism; in No. 30 we have tubules regressed to an infantile stage and adult interstitial cells with sexual maturity. On taking into consideration only the actual state of the testis one must conclude that the different result is caused by difference in the state of the interstitial cells, but taking into considera-

tion what had happened in the testis of both cases in the course of several months, one cannot exclude the possibility that beginning spermatogenesis, if indeed not a complete cycle, was necessary for the development of active interstitial cells. By such a point of view we analogize between what happens in the testicle and in the ovary, since in the latter it is believed that the transformation of inactive connective cells into active hormonic elements takes place by means of development of generative cells, i. e., by follicular development.

Berblinger (8) is disposed to think that our small testicular fragments were sufficient for a normal masculinization because the interstitial cells were hypertrophied and by this the resorption of the hormones which, according to him, are produced by the generative cells, was intensified. But this suggestion is not justified since small fragments can perform a quantitatively normal hormonic function even when there is no, or very insignificant, hypertrophy of the interstitial cells as we have shown in another paper (13).

III.

Against the theory that the interstitial cells play a rôle in the internal secretion of the testis the objection was made by several authors that there are cases where no signs of testicular hormonic activity have been observed although interstitial cells were present in great quantity. Such cases were reported by Bell (14), Benda (2), Dürck (15), and Berblinger (8). Experimentally such a situation was claimed to have been caused by Stieve (16). It is impossible to give here a detailed criticism of all the separate cases reported; the criticism in Stieve's case should be rather a severe one. I will mention only what we observed personally. On an animal (Prot. No. 41) of the same litter as No. 49 (see above) horizontal sections through the testis and the ductus epididymidis were made on both sides. The animal was observed for about six months. It remained eunuchoid as shown by the observation of the penis. Microscopical examination (fig. 4) of the testicle showed that spermatogenesis had ceased at a somewhat earlier stage than in No. 49; the diameter of the tubules was remarkably smaller than in the latter case; there was mostly only one layer of cells and only rarely desquamation. The interstitial cells were present in great quantity. Their dimensions were extraordinarily great, apparently due to

the fact that the protoplasm was packed full of droplets of fat. No differential stain for fat was employed, but the large vacuoles separated only by very small threads of protoplasm can be, I think, interpreted as remains of droplets of fat. In normal rabbits, guinea pigs and mice I never saw a similar picture. The nuclei of these cells was in general normal, but often they seemed to be pycnotic(?). In some places apparently normal interstitial cells were to be found. Many questions arise here. Were the interstitial cells normal or not and is the eunuchoidism in this case to be explained by an abnormality of the interstitial cells? Or was the eunuchoidism caused by a cessation of spermatogenesis? And if the latter is true what mechanism was here at work? Was the production of hormones impossible because the generative cells as the supposed producers of hormones have not developed? Or did the normal development of other hormone producers, i. e., the interstitial cells, become impossible because of the lack of one of the hypothetical conditions of this development, the lack of spermatogenesis? Were the interstitial cells normal or functional in all the reported cases in man? No answer can actually be given to all these questions. Much further experimental work is needed before we shall be able to decide among all the possibilities mentioned above.

IV.

We have seen that it is almost sure that normally developed interstitial cells are necessary for the normal hormonic action of the testicle, whereas no definite conclusion can be drawn as to the significance of different stages of generative cells for this function. Recently Stieve (3, p. 79) suggested that the hypertrophy of the testicle after unilateral castration is a proof of the endocrine function of the generative part. The increase in weight of the remaining organ is caused by an increase of the seminal tubules, and Stieve argues that this increase is nothing else than a compensatory hypertrophy of the generative part. But in a great number of experiments we were able to convince ourselves that no hypertrophy occurs when only a small testicular fragment is left in the body after the removal of the greater part of both testicles (17). We further were able to show with certainty that such a small fragment can substitute for two normal testicles in their hormonic function (5). In the case No. 30 mentioned above a fragment of less than 1 per cent of the

testicular mass present in the control animal was sufficient for normal masculinization, as also in some other cases. It follows from this that the hypertrophy of the remaining testicle in unilateral castration is not a compensatory one, i. e., not a hypertrophy caused by an increased endocrine function for the organism as a whole. Evidently some other factor not yet known to us is involved in the increase in weight which the remaining testicle undergoes after unilateral castration, a factor which has nothing to do with the hormonic function of the testis (17a).

Indeed, the objection could be made that these fragments are potentially greater, their actual mass being reduced only by the regression of the tubules. This objection is not justified: first, because the tubules are sometimes largely distended even when only one layer of cells is present; second, because the volume of the fragment is small even when compared with that of two whole testicles in which a regression of all the tubules was caused experimentally. But finally we were able to show that development of normal sexual characters is possible when the actual mass of the small fragment is not very far from its potential mass, the greater part of the tubules being in spermatogenesis. We twice made such an observation. In another paper I have discussed this question more fully. (17b). No doubt, no compensatory hypertrophy of the generative part occurs when diminished experimentally, and the increase of the remaining testicle after unilateral castration has nothing to do with the production of the sexual hormones.

On the other hand, we adduced evidence that also no compensatory hypertrophy of the interstitial cells occurs in small testicular fragments (13). As far as hypertrophy of interstitial cells is present it seems to be caused by some local factors among which a good blood supply plays evidently a great rôle (10). For these questions the reader may be referred to our previous papers.

V.

What I learned from my own observations on the histology of the interstitial cells in the testicle of mammals is that they can be demonstrated without great difficulty by staining with hematoxylin and eosin, the protoplasm of the cells being strongly eosinophilic. The preparations of Dr. Wagner, to whom I am greatly indebted for his histological work, show that the most

useful method of fixation for demonstrating eosinophilia of the interstitial cells is that of Helly (Müller fluid with 5 per cent formalin). Wagner employed in our experiments also other methods of fixation; those of Bouin and of Flemming, and staining by the Heidenhain and Kull-Altmann methods may be especially mentioned.

It would be of great interest to study the question of the interstitial cells in the testicle of mammals from a comparative point of view. We may state that there are great differences between the guinea pig and the rabbit. In the former characteristic eosinophilic interstitial cells appear a few days after birth, whereas in the latter the cells acquire the characteristic appearance of adult interstitial cells only at an age of about three months; I must omit some details here. Now the puberal development of the sex characteristics (the horny styles of the intromittent sack of the penis) begins in the guinea pig a few days after birth, whereas the rabbit enters into puberal development when about three months old. It is not yet certain whether these comparative statements, which *per se* are above any doubt, can be employed as a proof for the theory of the endocrine function of the interstitial cells. As far as we have seen, the beginning of puberal development of the sex characters is more or less synchronous, not only with that of the interstitial cells, but also of the generative cells. Let us hope that further research work along these comparative lines will be carried out by histologists.

The case of the triton is of especial interest from a comparative standpoint. Bresca (18) has shown by means of castration that the characteristic nuptial feature of the male triton is under the control of the testicle. This was lately confirmed by Aron (19), who showed that by bilateral castration a complete standstill in the development of the nuptial feature is determined when the operation is performed at the beginning of this development. As no interstitial cells are to be found in the intertubular tissue in the testicle of the triton its case was taken as a proof that the hormonic function of the testis in mammals cannot be performed by interstitial cells. Stieve (3) especially insisted on this. Such an assumption is erroneous from the outset, as there is no reason to think that in all the different species of the animal kingdom functions should be performed by similar

morphological means. It suffices to call attention to all the differences existing in the structures serving for digestion, excretion and locomotion among the different vertebrates. But Aron tried to show experimentally that the endocrine function of the testicle in the triton is really performed, not by the generative part, but by a special structure localized above the hilus of the testicle. This structure was studied in a detailed manner by Champy, who stated that these cells arise from the cells of Sertoli and at the time of heat form some kind of a false corpus luteum, the cells being filled with fatty granulations. Aron succeeded in destroying this structure by galvano-cauterization at the time of heat and stated that in several cases this operation leads to the same results as castration. Histological examination showed that the generative part of the testicle was not disturbed by the operation. It seems that Aron has created experimentally a situation like that observed by us accidentally in the rabbit (see above). Indeed, Champy (19a) has made different objections against the conclusions of Aron. I have no personal experience in this question and I am not able to have my own opinion in this.

As stated above the structure noted in the testis of the triton, being a special endocrine gland, is derived, according to Champy, from cells of Sertoli. But what is the origin of the interstitial cells in the mammals? There has been much dicsussion on this question. Are they derivates of connective cells or are they epithelial? New observations of Dr. Wagner leave no doubt that in the guinea pig after birth the interstitial cells arise from connective cells. But some years ago Rubaschkin showed, in a very remarkable paper (20; see especially 374-376), that in the testicular "anlage" of the guinea pig the interstitial cells develop from the genital cords formed by the mesoderm; and he suggested that the cells from which interstitial cells are derived after birth are possibly nothing else than cells which primarily were epithelial and afterwards became connective cells of the testicular stroma but remained able to transform themselves again into epitheloid interstitial cells. Also, the cells of Sertoli, arise in the guinea pig from the genital cords; the interstitial cells not only of the "anlage," but also of the adult testicle, would then be of the same origin as the cells of Sertoli. The observations of Aron in the triton, if they are correct, are of the greatest

interest in this connection. In guinea pigs I have also seen several times in testicular fragments undergoing degeneration, generative cells from rupturing seminal tubules poured out into the intertubular tissue. Could it be that hypertrophy of interstitial tissue is sometimes nothing else than transformation of cells of Sertoli and generative cells into interstitial cells? It may be also mentioned that Dr. Wagner found once in the normal testicle of a guinea pig about two weeks old several cells in the intertubular tissue which seemed to be true spermatogonia.

But whichever the origin of the interstitial cells may be, connective or epithelial, it would not be justifiable to found our standpoint as concerns their function on embryological data alone. It suffices to know that these cells are histologically glandular as pointed out by different authors. And what do we know of the biochemical function of the connective cells in general to be so prejudiced against a glandular function being attributed to a specialized variety of these cells? I do not think that it is very much.

VI.

There can be no doubt that no normal endocrine function of the testicle is possible without interference by other glands possessing internal secretions. Blair Bell (14), in a wonderfully written book which I read only lately, has called attention to all the various relationships between the sexual and the other endocrine glands. Bell had previously expressed his viewpoint on this question in 1913 by the formula: "Propter secretiones internas totas mulier est quod est." In my book on the puberty gland and lately in another place (21) I have pointed out that only the necessity for better orientation, in view of all the innumerable interrelations existing among the endocrine glands forces us to isolate mentally, so to speak, the sexual glands when investigating their endocrine function. This is nothing else than the so-called "Gedankenexperiment" of Mach we are performing in all scientific research. But Bell has not taken into consideration all the important work done since Steinach (22) in experimental feminization and masculinization by heterosexual transplantation of the ovary and the testicle. These experiments, especially those of Steinach (23) and of Sand (24) with simultaneous implantation of ovary and testis ("experimental hermaphroditism"), make it very probable that all the influences

the other endocrine glands have on the sex characters, go through the medium of the sexual gland, the latter being some kind of a junction for all those affecting normal feminization and masculinization. Further, it may be that the virility occurring in cases of hypernephroma in women or occurring sometimes in acromegaly (14), have nothing to do with normal masculinization, in the same way that the biochemical disturbances occurring in new growth are not at all similar to the chemical state under normal circumstances.

SUMMARY

The author presents a review of the experiments performed by himself and his co-workers on the interstitial cells of the mammalian testicle. Various data are adduced which have not been published previously. It is held that a normal condition of hormonic activity of the testicle of mammals is not possible without fully developed interstitial cells. A testicle with spermatozoa but with underdeveloped interstitial cells cannot perform its normal endocrine function. Completion of spermatogenesis is not necessary for the performance of the endocrine function. Normal endocrine function is possible even when no other generative cells than cells of Sertoli and spermatogonia are present in the tubules. The hypertrophy of the remaining testicle in unilateral castration is not compensatory since small testicular fragments do not hypertrophy and, furthermore, the sex characters can be normally developed when a fragment of only about 1 per cent is present in the body. The increase of the generative tissue in the testicle after unilateral castration has nothing to do with the endocrine function of the testicle. It is highly probable that the interstitial cells of the testicle are producers of sexual hormones; it may be that in extrauterine life they receive some impulse from the developing generative cells, like the granulosa and the theca interna of the ovary.

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SELECTIVE TUBERCULOUS INVOLVEMENT OF ENDO CRINE GLANDS—REPORT OF CASE WITH CLINICAL AND PATHOLOGICAL FINDINGS.

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The case here reported is unique in that there is a clinical history of disturbed function of the thyroid, pancreas, adrenal and probably hypophysis. Autopsy showed caseous tuberculosis peculiarly limited to all the endocrine glands. The history follows.

Mr. E. A. O'C., aged 28, a logger, had been married six years and had four healthy children. He was first seen February 9, 1917, saying that sugar had been found in the urine. For about a month he had noticed increased thirst and some polyuria. He was certain that in March, 1916, no sugar was found when he was examined.

Family History: His father died at 62 of pernicious anemia "following malaria" and was alcoholic. His mother died at 45 of tuberculosis. Two brothers were alive and well, although one had a goiter.

Patient's History: The patient had typhoid at 10 and articular rheumatism in 1903 and again in 1919, when he was confined to his bed for four months. Apparently there was no involvement of the heart. He was subject to bronchitis. He denied venereal disease. He had a hydrocele operation by Dr. Murphy in Chicago in 1910 and a thyroid operation at Rochester, Minnesota, in 1914, which he said was for simple goiter and for the relief of pressure symptoms. In 1911 he said he had a "dual personality" when he imagined he was Jesus Christ. This was associated with sensory disturbances in his legs, described as flickers and twinges of prickling sensations. He had been well otherwise, having no digestive, nervous, circulatory or urinary symptoms.

Physical Examination: The patient was muscular and was fairly nourished. He was 6 feet 4¾ inches in height, and 178 lbs. in weight. The hair distribution was abundant on the thorax, axillae, abdomen, arms and legs. The eyebrows were thick. He had no tremors, and no exophthalmos; the thyroid lobes were not palpated. The tonsils and teeth were negative. There was a scar of the thyroid operation. The eyes showed equal pupils, which reacted normally to light and accommodation and the movements were normal. His chest was long

and narrow; respiratory movements and expansion were normal. The lungs were negative except for some possible impaired resonance and slightly exaggerated breath sounds at the right apex. The heart was normal as to position and size except that the left border was palpated ¾ inch to the left of the mid-clavicular line. Sounds were clear except for a faint systolic blowing murmur at the apex. There was no decompensation; the blood pressure was 122-90. The abdomen was flat, and there were no masses or other abnormalities. The glands, joints and genitalia were negative. The reflexes were normal. Urine passed in the office showed 0.2 per cent sugar; 24 hour urine, 1440 cc. on usual diet, showed 0.15 per cent sugar; the acetone was moderate and insignificant thereafter. Sugar appeared in slight traces on the 6th day after treatment. His progress was uneventful. On the 16th day he weighed 172 lbs.; there was normal excretion, no sugar and no acetone. On the 25th day his weight was 167 lbs.; he said he felt weak and nervous; nervous twitching was manifest in both legs and he wondered if he needed thyroid extract which had been prescribed at Rochester, Minnesota, and which helped him before. His urinary output was normal and without sugar or acetone. Largely upon his suggestion, thyroid extract, grain 1 (Burroughs and Welcome), was prescribed daily on April 6th, the 45th day. His weight was then 173 lbs. On April 30th, he felt much better, ascribing the improvement to thyroid medication; he weighed 176½ lbs. and was on a slightly restricted diet. He was next seen on July 15th, working log booms and eating logger's diet. The urine was normal and he weighed 179 lbs.

He was not seen again until August 27th, when he said he had had tonsillitis and pleurisy two weeks before. The pleurisy had been on the right side. Examination showed no signs of fibrinous or serous pleuritis and he was not heard from until December 30th, 1917, when he wrote that he was not feeling well and that the glands under the jaw had been swollen for two weeks and were painful. There was no polyuria and appetite and general health had been normal since July, though he had had two rather severe headaches. He was not heard from then for about 13 months, when he was seen by another physician, complaining of severe occipital headaches. The urine was negative. There were no noteworthy findings. He was not seen then until September 8th, 1919, when he was met on the street. He was feeling well, but there was notable graying of the hair and the eyebrows had grown heavier. Examination of the urine at this time was completely negative and a chemical examination of the blood was made on the next day, fasting, showing sugar 0.083 per cent (normal), urea 27.5, creatinin 1. He had had no glycosuria for a long time, in spite of eating a liberal diet.

He made the assertion that he was always helped by taking thyroid extract.

He was not heard from again until May 17th, 1920, when he had

been admitted to the hospital because of severe headaches for a few days, and chilly sensations in the evening, lasting one or two hours. Headache had been almost constant. He had fever at the hospital, varying from 99 to 100.2; his pulse was 80, and respiration 22. Examination suggested the possibility of meningitis, although there were a few rales on deep inspiration over the right apex. Three days later he was unable to hold things in his left hand. He was nervous, chilly and slightly disorientated. On the 4th day he seemed rather dazed and had a slight muttering delirium. On the 5th day, very definite delirium was present. On the 6th day he had involuntary urination and died two days later. Lumbar puncture had been done on the 5th day of his stay in the hospital. The fluid was not under increased pressure, was perfectly clear, the cell count was only 3, the Nonne was 2+ and the Wassermann was negative. The Lange test was not made at that time. On the same day, definite signs of fluid were found in the left chest, but the clinical diagnosis was meningitis, probably tubercular. Blood examination on the 3d day showed leukocytes 10,000 and polymorphonuclears 68 per cent. Another fact of importance in the light of the autopsy findings was that the skin on the hands, wrists and the neck down to the collar band was unusually discolored and there were a few darkish colored patches on the buccal mucosa.

AUTOPSY

Autopsy on May 25th by Dr. R. L. Benson, Professor of Pathology, University of Oregon Medical School.

The hair was gray, the eyebrows were black and abundant, the axillary, chest and pubic hair was rather abundant and dark brown in color; the forearms and legs were covered with hair. The face and hands had a peculiar yellowish brown color, though the sclerae were clear. The teeth were present, except the right upper second molar. The left upper canine and the left upper incisor were crowned with gold. The mucosa of the lips and mouth was pale, although there was some brownish mottling of the buccal mucosa. There was a linear scar extending across the base of the neck in front, about 15 cm. in length, which was probably the healed scar of a thyroid operation. The body was well muscled. The chest was symmetrical. The abdomen was flat and symmetrical. There was no evidence of disease or injury in the chest or abdomen. The subcutaneous fat was scanty. The ossification of the ribs was normal. The *left lung* was free from adhesions and well aerated throughout, but contained several calcified nodules. The left chest cavity was full of fluid. The *right lung* was adherent at the apex by fairly dense adhesions which were broken with some difficulty. The apex was mostly consolidated irregularly and on cut sections revealed numerous small irregular tubercles, none of which was calcified to any extent. The remainder of the lung was well aerated and presented no abnormalities except a moderate degree

of hypostasis. Microscopic examination showed the miliary and conglomerate tubercles to be very numerous and the process appeared to be active in sections taken from the apices. Other sections showed inspissated and calcified tubercles. There was also a moderate chronic passive hyperemia. *Abdomen.* The omentum was thin and membranous. The transverse colon was greatly distended with gas and the serous surface was moderately congested. The peritoneal cavity contained 100 cc. of clear amber fluid. Throughout the lesser omentum and posterior to it were many caseous nodules, some partly calcified. The *liver* was of normal size and contour; its surface was smooth and presented no marked changes. The *bladder* was distended with urine. The serous surface contained several yellowish gray nodules and the surface in general was of a purplish blue color. The *pericardial sac* contained about 70 cc. of amber fluid. The *heart* was considerably larger than the owner's fist. The left ventricle was firmly contracted, while the whole right side was large, soft and flabby. The right ventricle formed a part of the heart's apex. The auricle was especially distended. The tricuspid valve admitted two fingers, and was fibrous and thickened. The thickness of the left ventricle was 12-14 mm. The region of the aorta was negative. The thickness of the right ventricle was 5 mm. The *right kidney* weighed 200 gm. and was in general pale and firm at the lower pole, while it was soft and a deeper color over most of the upper pole. There were several miliary grayish nodules in the surface of the lower pole. Microscopic examination showed a number of miliary and conglomerate tubercles with large giant cells in the medullary portion. Chronic passive congestion was present. The parenchyma showed relatively little change. The *left kidney* was, in general, normal in size and shape and similar to the right. The cut surface revealed the presence of several miliary to small caseous, irregular masses of yellowish color involving nearly all of the organ. The *pancreas* was somewhat larger than normal and of a light brownish color. In its head and partially surrounding it was a mass of large tuberculous nodules. The organ in general was of a woody consistency. Microscopic examination showed miliary and caseous tubercles to be numerous in the region of the head of the pancreas. The capsule was greatly thickened and the tuberculous process was seen to have invaded the parenchyma. The trabeculae were greatly increased in thickness and number to the extent that there was a marked atrophy of many lobules of the glandular tissue. The islands of Langerhans appeared for the most part to be atrophic, fragmented, and darkly stained. The *right testicle* was normal, but the epididymis contained a caseous tubercle; the *left testicle* and epididymis were normal. Microscopic examination revealed caseous tuberculosis in the right epididymis. The *prostate* was large. It cut more easily than normal and contained multiple caseous tubercles in all lobes. Large caseous tubercles were present in all the sections examined. There was marked atrophy and fibrosis of the gland

tissue. The *right adrenal* was of normal shape, but of greater dimensions than normal; its thickness was over 1 cm. at the lower and outer edge. It weighed 35 gm. The cut surface revealed a succession of large caseous tubercles 5-7 mm. each in diameter and occupying most of the organ. The left adrenal weighed 40 gm. and was similar to the right. Beginning between the *left adrenal* and the aorta and extending down toward the left posterior aspect of the aorta for several centimeters was a chain of firm nodules, ranging in size from a bean to several centimeters each, yellowish in color and on cut surface appearing comparatively lobulated and light gray and containing caseous tubercles. Microscopically, there were numerous large caseous tubercles. The cords of cells in both the medullae and cortices were fragmented, few in number, and widely separated by the congestion of the capillary blood vessels between them. The *thyroid* was present in two lobes, weighing together 35 gm. They showed scattered caseous tuberculosis. Microscopic sections showed the alveoli to contain the normal amount of colloid; the epithelial cells were for the most part low cuboidal to almost flat. There was considerable hyalin formation in the interstitial tissue. No tubercles were found in the sections examined. The *hypophysis* was slightly enlarged and showed diffuse, semicaseous tuberculosis. *Brain and membranes.* The dura was of normal thickness and appearance. The pia arachnoid was moist and irregularly hyperemic. The convolutions were in general flatter and longer on the left side than on the right. In the soft meninges over various sulci were miliary grayish opacities and one was irregular and 3 mm. in length. The anterior portion of the frontal lobes was unusually soft. There were a few miliary tubercles over the lower surface of the cerebellum. Microscopic examination showed that round cell infiltration was well marked in the pia covering the cerebellum. One of the sections from this region showed a pedunculated miliary tubercle. Other sections showed miliary tuberculosis also. The brain itself showed no noteworthy changes.

The *anatomical diagnosis* was as follows: caseous tuberculosis of both adrenals; caseous tuberculosis of the pancreas; caseous tuberculosis of the thyroid; caseous tuberculosis of the pituitary; caseous tuberculosis of the right epididymis and prostate; a few tubercles in the right kidney; caseous tuberculosis of the peribronchial and aortic lymph nodes; active miliary tuberculosis in the right pulmonary apex and healed calcified tuberculosis in both lungs; slight tuberculous meningitis; hemorrhagic cystitis; left cardiac hypertrophy and right cardiac hypertrophy and dilatation; and miliary tuberculosis of the spleen.

DISCUSSION

Since endocrine function is still far from clear, any attempt to explain clinical phenomena on anatomical foundations is

hazardous, but the following points stand out: (1) In a man of large frame (suggesting gigantism) and with marked hirsutism, a tuberculous hypophysis was found. (2) Peculiar bronzing of the hands and wrists and the pigmentation of the buccal mucosa suggesting Addison's disease, was associated with caseous tuberculosis of the adrenals. (3) Glycosuria was definitely present over three years before his death when he was under my care; caseous tuberculosis of the pancreas was found at autopsy. (4) A colloid goiter was removed 6 years before his death; caseous tuberculosis of the remaining portions of the thyroid was found at autopsy. (5) There was hydrocele operation 10 years before death; autopsy showed caseous tuberculosis of the right epididymis and prostate.

ENDOCRINE THERAPY IN MENTAL DEFICIENCY

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INTRODUCTION

The fact has been established that disorders of the endocrine glands are fairly common among mental defectives. Observations to this effect are of daily occurrence to those whose experience deals with mental defectiveness. At Letchworth Village a survey has shown that about one-third of the inmate population show undoubted evidence of an endocrine imbalance. Raeder reports that pathological changes in one or more of the ductless glands were discovered in seventy-six out of one hundred cases of feeblemindedness coming to autopsy. Timme has pointed out a peculiar conformation of the sella turcica in Mongolism, which is possibly related to a pathology of the anterior lobe of the pituitary.

Whether a glandular imbalance is responsible for the stunting of intellectual growth or whether it is only a part of a general tissue inferiority, no one is able to state. Both are probably correct. The matter resolves itself into determining, if possible, what the exact relation may be. There have been cases reported where the mental defect seemed closely dependent on glandular elements, while there are other cases where the endocrine dysfunction seems to be merely one of the various symptoms of a general and widespread inferiority.

Glandular therapy, according to reports on an occasional case, has proved of value in stimulating intellectual development; in other cases it has been a distinct failure. What are the fundamental characteristics which in one type of case warrant hopes of improvement, while in the other indicate that glandular treatment is useless?

Before endocrine therapy can prove of any real practical value in mental deficiency we must establish certain criteria which will aid in the selection of cases that may be materially benefited by treatment. It is with this idea that glandular treatment has been tried on a few selected cases at Letchworth Village.

The cases chosen belonged to three endocrinopathic groups, namely, the status-thymico-lymphaticus, the hypothyroidal, and the dyspituitary. Most of these cases, although corresponding more or less closely to the group in which they were classed, also showed one or more characteristics of either one or both of the other groups. It is well to realize at the outset that nearly all cases of endocrine disorders among the feebleminded are of pluriglandular significance.

The cases studied had been in the institution for a year or more. Consequently their habits, reactions, and rate of progress were fairly well established. Immediately before instituting treatment, they were given a thorough physical examination, including height, weight, blood pressure, and blood sugar content. Their intelligence was measured by the Terman scale and a few characteristics such as alertness, industrial efficiency, energy, social adaptability, and mood were noted. Other symptoms referable to the glandular disturbance, such as headache, lassitude, fatigability, enuresis, and menstrual abnormalities, were observed.

These cases were then placed on glandular therapy; ample precautions were taken to insure its being carried out conscientiously, and the observations were repeated six months later.

Any changes in the physical characteristics and build were noted. In determining the influence on the rate of accretion in stature and weight it was essential to express any such increase in relation to the normal rate of growth for the various ages represented by the cases in this study, as many of them were still in the developmental period. Changes in the systolic, diastolic, and pulse pressures were determined. The blood sugar content was again determined at the end of the six months' period of glandular feeding.

The influence of endocrine therapy on the growth of intelligence was determined by comparing the amount of increase during a control period with the amount during the six months' treatment. Although in many instances these tests were not

given by the same individual in the first and second examinations, they were given by observers of adequate experience.

After due consideration it was thought best to disregard any margin of error, first, because if such was not done, matters would be so complicated that nothing could be said concerning the results; and second, if such a margin was given consideration, to be accurate, it would have to be considered as possibly affecting either favorably or unfavorably both the positive and negative cases.

THE STATUS-THYMICO-LYMPHATICUS GROUP

This group consisted of nineteen cases. All except one were males. Their ages ranged from 8½ to 19½ years. The average age was 13½ years.

Physical Characteristics: In general build they were rather slender and loose-jointed. The skin was of a soft, velvety, delicate texture with a noticeable absence of the usual fine hairs. In all cases the genitals were small and under-developed. In three cases the gonads were undescended. Fourteen showed a varying degree of inversive characteristics. Nine were chronic bed-wetters.

Height: Ranged from 123.4 cm. to 158.2 cm. The average was 139.2 cm.

Weight: Ranged from 53 lbs. to 105 lbs., the average being 76¼ lbs.

The *index of build*, based on the average height and weight of this group, was 24. The average index of build for normal males at 13½ years is 26.

Blood Pressure: The systolic blood pressure ranged from 75 to 120, with an average of 95. The diastolic pressure ranged from 60 to 80, with an average of 74. The pulse pressure in all the cases was noticeably low, and the average for the group was 21, or about thirty per cent of the diastolic pressure.

The *blood sugar* content, obtained after a fourteen hour fast, was decidedly low in all cases. It ranged from .038 to .090, with an average of .060.

Intelligence: The percentage of normal intelligence ranged from 17 to 76. The average was about 55. This group consisted of one idiot, three imbeciles, eleven morons, and four borderline types.

Personality: With the exception of two subjects who were unusually stubborn and irritable, there was nothing of note in the personalities of these cases.

Treatment: Endocrine therapy was carried on with the patients continuing under the same living conditions. Treatment consisted of Armour's desiccated thyroid and whole gland pituitary substance given by mouth. Minimal doses were used at the start and gradually in-

creased to the limit of tolerance. Unfavorable reactions such as severe headaches, vertigo, nausea, vomiting, and syncopes were frequently noted, especially when the tolerance to pituitary substance was exceeded. In no case could three grains of thyroid and three grains of pituitary a day be safely exceeded.

The following observations were made after six months of treatment.

TABLE I—HEIGHT

	NO. OF CASES		
	Status Group	Hypothyr. Group	Dyspit. Group
Stationary	2	2	17
Increase less than normal rate*	4	2	0
Increase coincident with normal rate	2	2	0
Increase exceeding normal rate by 0.5 cm.	3	2	0
Increase exceeding normal rate by 1.0 cm.	2	2	0
Increase exceeding normal rate by 1.5 cm.	3	2	0
Increase exceeding normal rate by 2.0 cm.	0	1	0
Increase exceeding normal rate by 2.5 cm.	1	2	0
Increase exceeding normal rate by 4.0 cm.	0	1	0
Increase exceeding normal rate by 7.0 cm.	2	0	0

TABLE II—WEIGHT

	NO. OF CASES		
	Status Group	Hypothyr. Group	Dyspit. Group
Stationary	3	5	14
Loss	0	0	3
Increase less than normal rate	3	1	0
Increase coincident with normal rate	3	2	0
Increase exceeding normal rate by 1 to 2 lbs.	2	1	0
Increase exceeding normal rate by 2 to 4 lbs.	3	3	0
Increase exceeding normal rate by 4 to 6 lbs.	2	3	0
Increase exceeding normal rate by 6 lbs.	3	1	0

Physical Characteristics: The general build, so far as all appearances were concerned, remained unchanged. The skin had the same soft, velvety, and delicate texture, and in but two cases did the hairy growth seem more normal. In the three cases with previously undescended gonads, descent into the scrotum had occurred. The cases with inversive characteristics remained the same as before treatment. Of the nine bed-wetters, only two continued to give any marked trouble in this direction.

Height (Table I): In two subjects, one aged 16½ years, and the other 19½ years, there was no increase in stature. In 4 cases there was some growth, but it was less than the normal rate; the ages in these cases were 13, 14, 14, and 15 years respectively. In 2 subjects, one 13 years old and one 16 years old, the growth rate was normal. In 11 cases the normal rate of growth was exceeded by one-half to seven centimeters; in 4 of these the ages were between 15 and 17 years. The average height after treatment was 142.2 cm.

* The normal height and weight curves used in this study were furnished by C. B. Davenport.

Weight (Table II): Of the nineteen cases, ten patients showed a definite gain of 1 to 6 lbs. over the normal rate. The average weight of the whole group after treatment was 80.5 lbs.

The *index of build* remained essentially unchanged for the whole group, it still being about 24.

TABLE III—BLOOD PRESSURE

	NO. OF CASES		
	Status Group	Hypothyr. Group	Dyspit. Group
A. Systolic blood pressure—			
Stationary	3	9	12
Loss	0	1	0
Increase of 5 mm.	6	1	2
Increase of 10 mm.	4	2	1
Increase of 15 mm.	3	3	1
Increase of 20 mm.	3	0	1
B. Diastolic blood pressure—			
Stationary	9	11	15
Increased	3	2	0
Decrease of 5 mm.	4	0	2
Decrease of 10 mm.	2	2	0
Decrease of 15 mm.	1	0	0
Decrease of 20 mm.	0	1	0
C. Pulse pressure—			
Stationary	4	9	12
Increase of 5 mm.	4	4	0
Increase of 10 mm.	4	0	4
Increase of 15 mm.	4	1	1
Increase of 20 mm.	3	1	0
Increase of 25 mm.	0	1	0

Blood Pressure (Table III): In all but three cases the systolic blood pressure was raised from five to twenty mm. The average systolic pressure after treatment was 104. The diastolic pressure remained unchanged in nine cases, was increased in three cases, and lowered from five to fifteen mm. in seven cases. The average diastolic pressure after treatment was 73 mm. The pulse pressure remained unchanged in four cases, but in the remaining fifteen it was increased from five to twenty mm. The average pulse pressure after treatment was 31 mm. or about forty-two per cent of the average diastolic pressure.

In general it may be said that the vascular tone was noticeably improved. To support this it might be mentioned that before treatment, on drawing the blood from the median basilic vein for the blood sugar test, at least seventy-five per cent of the subjects became light-headed or fainted. On the next occasion for this operation, after treatment, not one even complained of feeling light-headed, dizzy, or nauseated.

Blood Sugar (Table IV): In each case the blood sugar content was materially increased. The increase amounted from .021 to .098 per cent. The average blood sugar content after treatment was .116

Intelligence (Table V): In ten cases of the group there was no gain in mental age. In two the gain was of doubtful significance. In seven, however, the gain was quite striking, especially when one considers that a gain of 5 or 6 months in 5 cases, and a gain of 12 and 19 months respectively in two other cases was made in a short period of half a year; it is also to be remembered that the increase stated above is that in excess of the expected gain. Table VI shows the ages of these subjects who improved.

Personality: There were no changes in character or temperament of any case in this group.

TABLE IV—BLOOD SUGAR

	NO. OF CASES		
	Status Group*	Hypothyr. Group	Dyspit. Group
Stationary	0	14	17
Decreased to normal	0	2	0
Increased by .020 to .029	1	0	0
Increased by .030 to .039	4	0	0
Increased by .040 to .049	1	0	0
Increased by .050 to .059	5	0	0
Increased by .060 to .069	1	0	0
Increased by .070 to .079	3	0	0
Increased by .080 to .089	1	0	0
Increased by .090 to .099	1	0	0

TABLE V—INTELLIGENCE

(Based on expectancy of gain in Terman test for a six month period as determined by actual gain prior to treatment.)

	NO. OF CASES		
	Status Group	Hypothyr. Group	Dyspit. Group
Not exceeding or less than expected gain	10	11	14
Exceeding expected gain by 2 to 3 mos.	2	0	0
Exceeding expected gain by 4 mos.	0	1	0
Exceeding expected gain by 5 mos.	3	0	1
Exceeding expected gain by 6 mos.	2	1	1
Exceeding expected gain by 7 mos.	0	0	1
Exceeding expected gain by 8 mos.	0	1	0
Exceeding expected gain by 12 mos.	1	0	0
Exceeding expected gain by 15 mos.	0	1	0
Exceeding expected gain by 17 mos.	0	1	0
Exceeding expected gain by 19 mos.	1	0	0

SUMMARY

The results of endocrine therapy in the status-thymico-lymphaticus group are as follows. There was no change in general build or texture of skin. In two cases distribution of hair became more normal. In three cases descent of the testes into the scrotum occurred during treatment. Of nine chronic bed-wetters, 7 were relieved of their enuresis. This, however,

* Two cases not estimated. Vein could not be tapped.

may have been a matter of training, as such results are not uncommon in cases receiving no special treatment. In eleven cases the normal rate of growth was definitely exceeded. In ten cases the normal rate of increase in weight was exceeded by one to six pounds. The index of build remained unchanged. In practically each case the vascular tone was substantially improved. In each case the blood sugar content was raised to well within normal limits. In seven cases there was a definite increase in mental age. In five of these there was increase practically month for month for the time under treatment; one showed an increase of two months and one an increase of three months in mental age for each month of the period in which glandular therapy was carried on. There were no character changes in this group of cases.

TABLE VI—ACTUAL AGE OF THE FIFTEEN CASES SHOWING AN INCREASE IN INTELLIGENCE

A. Status-Thymico-Lymphaticus Group

Intelligence gain (in months)	Actual age (in years)
5	8
5	13
5	14
6	9
6	13
12	12
19	16

B. Hypo-thyroid Group

Intelligence gain (in months)	Actual age (in years)
4	14
6	9
8	18
15	13
17	14

C. Dyspituitary Group

Intelligence gain (in months)	Actual age (in years)
5	26
6	16
7	23

HYPOTHYROID GROUP

This group consisted of sixteen cases. Fourteen were females and two were males. Their ages varied from 8 to 19 years. The average age was 12 years, 2 months.

Physical Characteristics: In general build they were all inclined to be short and stocky. The long bones were short, the hands more or less trident in shape, the bridge of the nose flattened, the lips thick, and the skin dry, scaly, and thickened. The hair was noticeably dry and in three cases there was a marked seborrheal eczema of the scalp.

The *height* ranged from 118.0 cm. to 154.3 cm., the average being 131.7 cm.

The *weight* ran from 45 lbs. to 159 lbs., with an average of 75 lbs.

The *index of build*, based on the average height and weight, was about 27.5. The normal index of build for the average of the ages represented in this group would be about 25.

Blood Pressure: The systolic pressure varied from 78 to 150, with an average of 101. The diastolic pressure varied from 60 to 80, with an average of 78. The pulse pressure was rather low, the average for this group being 23 or about 35 per cent of the diastolic pressure.

The *blood sugar* estimation, the sample having been obtained after a fourteen hour fast, showed a content ranging from .077 to .140, with an average of .097.

The *intelligence* quotient ranged from 24 to 75, with an average of 46. In this group were seven imbeciles, eight morons, and one borderline type.

Personality: With but few exceptions the members of this group were of a dull, lethargic, listless, easily fatigable, phlegmatic type.

Treatment: Glandular treatment was prescribed and carried on under careful supervision. It was found that the subjects could tolerate thyroid substance to the limit of three to six grains daily. Iodine in the form of sodium iodide was given along with the thyroid. Later during the course of treatment whole gland pituitary substance was added and in some cases was run up as high as three grains daily. Three cases, which were originally started in this group had to be discontinued, two developing pulmonary tuberculosis and one developing a hypomanic mental state.

The following observations were made after a six months' course of treatment.

Physical Characteristics: The general build remained unchanged. There was a noticeable difference in the texture of the skin in every case. In every instance the skin became smooth, moist, and quite normal in texture. The hair ceased to be dry and brittle, and the three cases of seborrheal eczema entirely cleared up; these cases had heretofore resisted all efforts in the form of inunctions, washes, and other local applications.

Height (Table I): Six subjects either remained stationary, grew at a rate slower than normal or grew at a rate consistent with the normal. Two that did not increase in height were over 16 years of age. Of the two that did not grow as rapidly as normal, one was 8 and one was 12 years old. The two that grew at the same rate as the normal for their respective ages were 8 and 13 years old. Of the ten that grew at a rate exceeding the normal for their respective ages, three were between the ages of 16 and 19.

Weight (Table II): Eight subjects, or just one-half of the number in this group, showed a net gain in weight ranging from two to nine pounds each.

The *index of build* remained essentially unchanged.

Blood Pressure (Table III): In over half of the subjects the blood pressure was not materially affected. The average systolic pressure after treatment was 104, the average diastolic 70, giving a pulse pressure for the average of 34, or just about 50 per cent of the diastolic pressure.

The *blood sugar* content (Table IV) was not materially changed except in two cases. In these, a content of .140 and .138 were decreased to .097 and .093, respectively. The average blood sugar content after treatment was .090.

Intelligence (Table V): In five cases the mental age increased well above what would have been expected in each individual case. The figures shown in Table V represent an increase over and above the expected gain based on the rate observed before instituting treatment. Table VI shows the ages of the subjects that improved.

Personality: In but three cases was there any improvement in the stolid, phlegmatic, dull temperament characteristic of this group. These three cases were among those that also showed an improvement in the intellectual sphere as well. They became rather more alert, active, and rather quicker to learn.

SUMMARY

In all cases the general build remained unchanged. In all, there was a definite improvement in the texture of the skin. In three cases a stubborn eczema of the scalp cleared up entirely with glandular treatment. Ten subjects exceeded the normal rate of increase in stature for their respective ages. Eight made an appreciable increase in weight in excess of what would have been normal for their respective ages. The index of build remained unchanged. There was but little change in the blood pressure with the exception that the diastolic pressure fell, thus making the pulse pressure approximate quite close to the normal. The blood sugar content remained essentially unchanged except in two cases where it was originally rather high it was brought down to well within the limits of normality. In five cases there was a definite increase in mental age above what would have been expected from the progress before treatment. Although it cannot be definitely stated, it would seem as though the organotherapy must have been at least a factor in producing this improvement. In three cases, among those that showed the marked increase in mental age, there were certain character changes

from a dull, apathetic, indifferent state to one of alertness and a greater activity of interests.

DYSPITUITARY GROUP

This group comprised eighteen cases. One subject had a marked intolerance for both pituitary and thyroid substance, either of which produced a severe cardio-vascular collapse, and for this reason could not be continued on treatment. All cases in this group were of females, their ages ranging from 15 to 32. The average age for this group was about 25 years.

Physical Characteristics: The physical characteristics of this group were somewhat variable. Generally speaking, however, the subjects tended to be rather heavy in general build, with a tendency to over-growth in the long bones, narrow maxillae with crowded irregular teeth, half of them having menstrual disorders in the form of scanty, irregular periods, and many of them complaining of severe headaches. Four subjects, although past the age of maturity, had never menstruated.

The *height* ranged from 144.1 cm. to 166.1 cm., with an average of 154 cm.

The *weights* varied from 103 lbs. to 170½ lbs., with an average of 143 lbs.

The *index of build*, based on the average height and weight of this group, was about 38. The normal index of build for the average age represented by this group is about 31.

Blood Pressure: The pressures did not show any marked deviation from the normal. The systolic pressure varied between 95 and 135 mm., with an average of 110. The diastolic ran from 70 to 90 mm., with an average pulse pressure of 33 mm., which was about 43 per cent of the average diastolic pressure.

The *blood sugar* was quite within normal limits in all cases, showing a rather narrow variation from .81 to .115. The average blood sugar was .100.

Intelligence: The percentage of normal intelligence ranged from 27 to 66. There were three imbeciles and fourteen morons in this group. All of them had supposedly reached their limit of intellectual growth. The average I. Q. was 52.

Personality: Irritability and emotional instability with a tendency to sluggishness was, with two exceptions, common to all the subjects in this group.

Treatment: Of all the subjects under treatment those in this group required by far the most attention. Many of them seemed specially susceptible to pituitary substance so that severe headaches, vertigo, and syncopes were not uncommon. The dosage had to be increased with a great deal of caution, although with a few exceptions

they were finally able to take as high as three grains of pituitary daily. In certain cases in which there seemed to be indications of an underactive thyroid gland thyroid was also given. In cases with menstrual disorders corpus luteum was given in courses of ten days or two weeks each month.

At the end of a six months' course of treatment the following observations were made.

Physical Characteristics: There was no change in the general build. Of the four subjects who had never menstruated, three began to have their periods at regular intervals; one of these began one month after endocrine therapy was instituted, one, two months after, and one, three months after. These three were all 16 years of age. Those who had irregularities of their periods showed no improvement. Severe headaches, frontal in character, which were common to the majority of the cases before treatment, almost entirely disappeared.

Height (Table I): In no case was there any increase in stature.

Weight (Table II): With a few exceptions there were no significant changes in weight. Three or four subjects, who were rather obese, lost eight or ten pounds each.

The *index or build* remained unchanged.

Blood Pressure (Table III): In but five cases was there any change in blood pressure. These cases, however, were those with a pressure somewhat subnormal and during the course of treatment their pressures were brought up to normal.

Blood Sugar (Table IV): In no case was there any change in the blood sugar content which was marked enough to be of any more significance than merely a normal variation.

Intelligence (Table V): Three subjects in this group, although having presumably reached the limit of their mental development prior to treatment, showed a gain of five, six, and seven months respectively; Table VI shows the ages of these three.

Personality: With but two exception, there was no change in the temperament of the subjects in this group. One of those who became more alert and less irritable also had gained six months in her mental age. The other, who had been quite untrainable before treatment, became able to sweep, polish, and make beds.

SUMMARY

Relative to this group the following can be said regarding the effects of glandular treatment: The general build and conformation remained unchanged. Menstrual irregularities were not improved. Of four subjects who had not yet menstruated, three had their initial periods from one to three months after starting treatment, and continued to menstruate regularly thereafter. It is to be pointed out, however, that these girls were

only 16 years of age, and that the one in whom the catamenia did not appear was 26 years old. As would be expected there was no increase in stature in any case in this group. Three subjects, who were much over-weight, lost eight or ten pounds each. Otherwise there were no changes. Only those subjects who showed a pressure below normal were affected. In these the blood pressure was brought up to normal. There was no essential change in the blood sugar. Three subjects showed a definite increase in their mental age which could not be accounted for by a factor of error or normal variation in the test. In but two cases was the character influenced in any way whatsoever. Of these, one patient had shown an increase of 6 months in mental age and become rather more alert and active. The other changed from a useless, vegetating state to one in which she became useful in the grosser tasks of housekeeping.

SYNOPSIS

This paper comprises a detailed report on the characteristics of certain types of endocrine disorders seen among the feeble-minded with a discussion as to the effects of endocrine therapy. Fifty-two cases, chosen with respect to three types of endocrinopathies, were first studied in detail as to general physical characteristics, height, weight, index of build, blood pressure, blood sugar content, intelligence, and personality. They were then subjected to a conscientiously planned and well supervised course of organotherapy given in accordance with certain indications as shown by the physical and mental make-up. At the end of a six months' course of treatment each case was again studied and observations made relative to the various angles of the case as stated above.

For purposes of brevity and clarity it would seem best to take up each endocrinopathic group by itself.

The Status-Thymico-Lymphaticus Group.—This group consisted of nineteen cases, all except one of which were boys. All were quite typical cases from an endocrine point of view. Speaking in averages their age was 13½ years and they belonged to the middle grade moron group intellectually. Endocrine treatment consisted of thyroid and pituitary substance according to the needs of each individual case. Unfavorable reactions, such as severe headaches, vertigo, nausea, and syncope

were common, as a result of exceeding the tolerance, especially to pituitary substance.

Following treatment, 60 per cent of the cases showed a decided gain in height and weight over what would have been the normal rate for their respective ages. Cases in which the gonads were previously undescended showed them after treatment to be in their normal position. At least 85 per cent showed a definite improvement in their vascular tone. In 100 per cent the blood sugar content was increased far beyond what could be accounted for by a normal variation. The blood sugar content in every case had previously been definitely low.

Relative to mental age, in seven cases, or about 37 per cent, there was an unmistakable increase in the intellectual level as measured by the Terman scale. This gain was of special significance in that under no circumstances would it have been predicted on the basis of what each case had done previous to any treatment. This net increase ranged from five to nineteen months.

The Hypothyroid Group.—This group consisted of sixteen cases, ranging in age from 8 to 19, mentally of the low grade moron level; fourteen were girls and two were boys. All showed the characteristic symptoms referable to a persistent and long continued poverty of thyroid secretion.

Large doses of thyroid substance were well tolerated. They were accompanied by iodide and, later, by small doses of pituitary substance.

Naturally, there was no change in the general physical build, but the thick, dry skin, brittle hair, and in some cases stubborn eczema-like eruptions on the scalp were remarkedly benefited. In fact, these conditions became entirely normal. Sixty-three per cent showed a material gain in height and weight over what would have been the normal rate for their respective ages.

In about 40 per cent of the cases in this group the blood pressures were below the limits of the normal. Glandular therapy, in each of these 40 per cent, resulted in augmented pressure. The treatment, however, did not affect the blood pressure when it had been normal at the outset.

What has just been said regarding blood pressure also applies to the blood sugar content in the cases in this group. In only two cases, and in these the blood sugar content was quite

high, was there any material change; in both of these the sugar content was brought down to well within the limits of normality.

Relative to mental development, five cases showed a definite net increase. The increase above the expected rate of progress was 4, 6, 8, 15, and 17 months, respectively, during the six months they were under treatment. In other words, about a third of all the cases in this group showed a definite and unmistakable gain in mental age.

As to improvement of the dull, lethargic attitude common to nearly all cases in this group, but three showed any improvement.

It should be stated that three cases not included in this final report had to be dropped during the first month of treatment. Two developed pulmonary tuberculosis and one became hypo-manic.

The Dyspituitary Group.—The cases in this group were characterized by a tendency to overgrowth of the long bones, with excess weight, narrow maxillae, crowded teeth, severe headaches, menstrual disorders, and considerable emotional instability.

There were eighteen cases in this group, all females, and all adults, mostly between the ages of 20 and 30, although there were five between 16 and 18 years of age. Mentally, they were of the low or middle grade moron in type.

This group presented the greatest difficulty as to endocrine treatment. Susceptibility to overdoses of pituitary substance was marked and the utmost precision was required to prevent severe headaches, vertigo, and, in some cases, cardio-vascular collapse. In fact, one case not included in this number could not be carried along in the experiment for this reason. In certain cases in which the physical condition seemed to indicate it, thyroid was later added to the treatment.

At the end of a six months' period of treatment it was found that this group showed much fewer effects than either the status-lymphaticus or the hypothyroid cases.

There was no appreciable change in physical characteristics, blood pressure or blood sugar; and as the subjects had passed the period of growth and accretion, naturally there was no increase in height and no significant change in weight, except a reduction in three that were much overweight. Of four with absence of

catamenia, three had their periods established one, two, and three months after beginning treatment. These subjects, however, were 16 years old, so that it would be unsafe to assume that the endocrine treatment was responsible for this. Cases with menstrual irregularities, despite the addition of corpus luteum substance to their treatment, were unaffected. Practically all the subjects who had suffered with frequent severe frontal headache were materially relieved. There was no change produced in their difficult personalities, with the exception of two cases. Both of these subjects, although rather irritable, were of a sluggish, phlegmatic disposition rather than emotionally unstable.

As regards the increase in mental age as shown by the Terman scale, three subjects made a net gain of 5, 6, and 7 months, respectively. In none of these was one warranted to expect an improvement, as all had presumably reached the limit of their mental development.

Now considering the results of this preliminary experiment purely as to the question of its effect on the mental defect of our cases, what do we find?

Out of a total of fifty-two cases, fifteen or nearly 30 per cent showed a definite improvement. This improvement consisted of an increase of from four to nineteen months as determined by the Terman scale over what could have been predicted considering their rate of progress prior to instituting glandular therapy. The aggregate net gain made by these fifteen cases amounts to 126 months or an average of 8.4 months for each patient. On examining the individual records of each of these cases it is found that there is a close correlation between the mental and physical improvement. In fact, in every case but one an improvement in the general physical condition, blood pressure, blood sugar content, or net increase in height and weight was found.

CONCLUSIONS

Inasmuch as this is a report of merely a preliminary experiment it would not be wise to draw any hard and fast conclusions. However, it would seem safe to say that endocrine treatment does produce certain changes for the better in deranged physical conditions in that it tends to adjust abnormally low blood pressures, that it exerts an influence on sugar metab-

olism, that it stimulates growth and accretion in those cases still in the developmental period of life, and that in a certain few cases it may be a factor in speeding up or stimulating the growth of a sluggish or enfeebled intelligence.

To be able to predetermine what cases will respond favorably to endocrine therapy is the important issue. This end can be accomplished only by a tedious and painstaking gathering of data on such of the feebleminded as do show some indication of responding favorably to glandular treatment. It is essential that cause and effect be not confused.

Let it suffice to say, for those who may be inclined to apply this report too generally, that endocrinology may at some time in the future explain the origin and offer a promise of a certain amount of improvement in only a selected small percentage of our mental defectives. Finally, to regard endocrine therapy as a panacea for mental deficiency would curtail what legitimate use it may subserve.

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EXPERIMENTAL INVESTIGATION OF THE VALUE OF THE VARIOUS COMMERCIAL OVARIAN EXTRACTS*

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Much has been done and written on the therapeutic value of the numerous endocrine preparations, but unfortunately, most of the work is empirical in nature. While it is true that many valuable facts have been acquired in this way, still it seems that

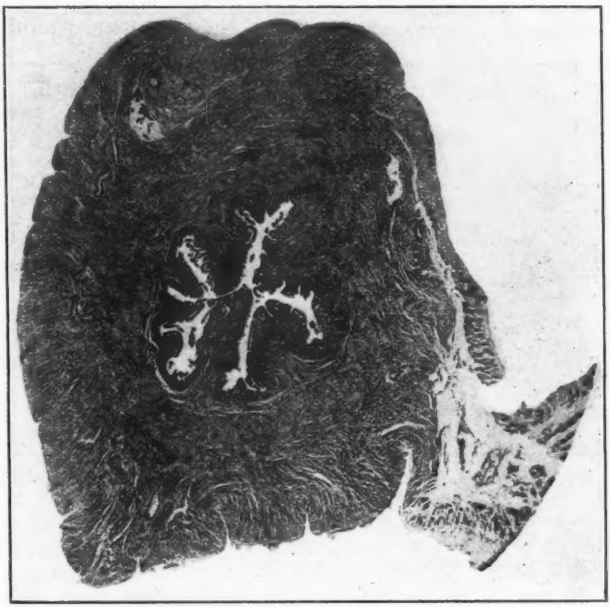

Fig. 1. Uterus 4 days after castration; 3 injections of Parke-Davis Corpus Luteum.

the mass of evidence is based on the interpretations of the investigators and the statements of the patients, which statements may be influenced psychically.

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It would be much more advantageous if we could experimentally demonstrate the clinical value or a definite physiological activity of the commercial endocrine products, and be able at any time to duplicate the results.

There are many objections to the empirical method in addition to those mentioned above, for we know that it is extremely difficult at the present time to classify accurately the various types of endocrinological syndromes, with few exceptions, and in addition, the overlapping of groups makes the results of investigation more uncertain.

Certain preparations, we can administer with a fair degree of precision. The thyroid, the adrenal and the posterior pituitary

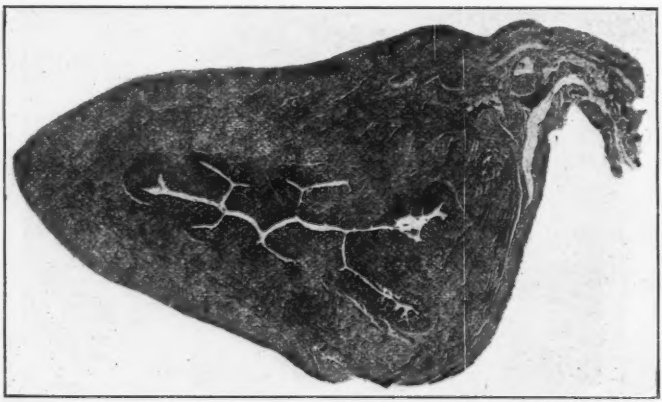

Fig. 2. Uterus 6 days after castration; 4 injections of Hynson, Westcott & Dunning Ovarian Residue.

extracts give a definite physiological response, and experimentally these responses can be shown to be constant.

It was with the intention of establishing some definite method of determining the value of the various ovarian preparations that this investigation was undertaken.

I wish to thank the various manufacturers of these preparations, who so kindly donated the material for the experiments, and expressed their interest in the work and their desire to cooperate, namely, Parke, Davis & Co., Hynson, Westcott & Dunning, The Wilson Laboratories, and Burroughs, Wellcome & Co. Of the Hynson, Westcott & Dunning preparations, we used the

Corpus Luteum, the Ovarian Substance and the Ovarian Residue. Of the Parke-Davis preparations, the Corpus Luteum and the Ovarian Substance with corpus luteum and without corpus luteum was used. Of the Wilson preparations, the Corpus Luteum was used. We did not complete the experiments with the Burroughs-Wellcome preparations, as we found that feeding experiments were too uncertain.

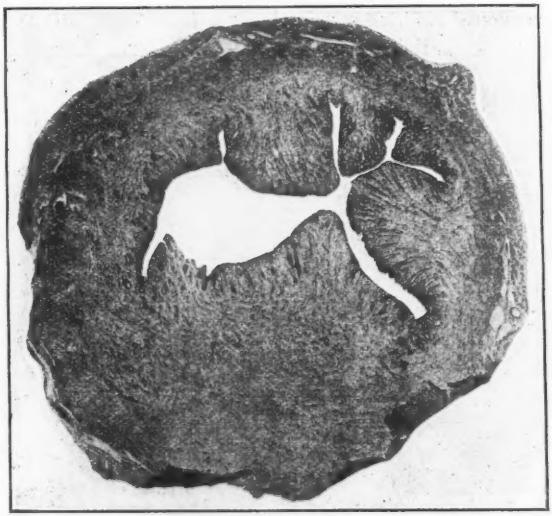

Fig. 3. Uterus 12 days after castration; 4 injections of Wilson Corpus Luteum.

It is a well established fact that after castration a definite atrophy of the uterus takes place, and it was with the idea of using this phenomenon as an indicator that the experiments were undertaken. We attempted to determine, if by the administration of these various preparations by intravenous injections the atrophy could be prevented, minimized, or, if possible, hypertrophy could be obtained. At the same time, the breasts were also observed as well as the thyroid, hypophysis and adrenals, to determine if the administration of these preparations had a definite effect on any of them. Controls were made by subjecting animals to the same operative procedures, but without administering the drugs.

In the beginning we used 1 cc. of the substance for daily injection, but as the animals died after four or five injections, it was decided to increase the time interval between injections, so that 1 cc. was given every third day, beginning from five to seven days after operation.

The castrations were performed in a very simple manner. The animals were anaesthetized, the abdomen shaved and sterilized with iodine. The ovaries and a small portion of the tubes were removed without interfering with the blood supply to the

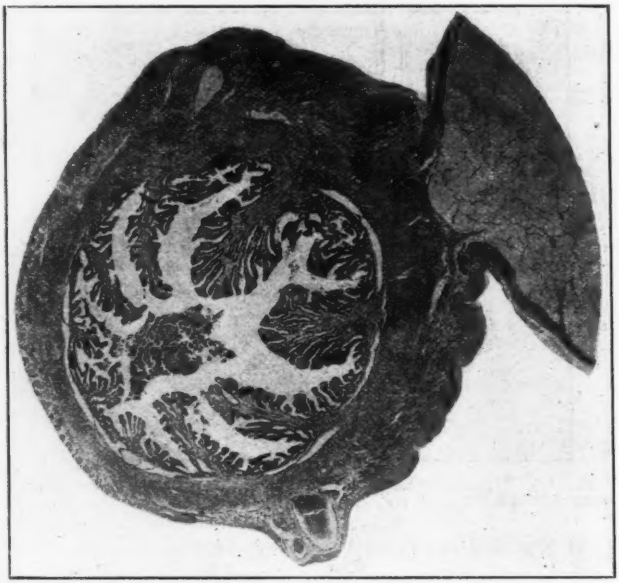

Fig. 4. Uterus at time of operation.

uterus. At the same time a small segment of the uterus near the horn was removed as a control and one breast also. Before operation the animals were weighed, and when they had recovered from the operation after a period usually of 48 hours, they were put on the same food as before operation.

Fifty-two animals were used. Several died 24 hours after operation of pneumonia and shock. Several died 4-6 days after operation from the effects probably of the daily injections

Fig. 5. Same as Fig. 4, 60 days after operation; 25 injections of Parke-Davis Ovarian Residue.

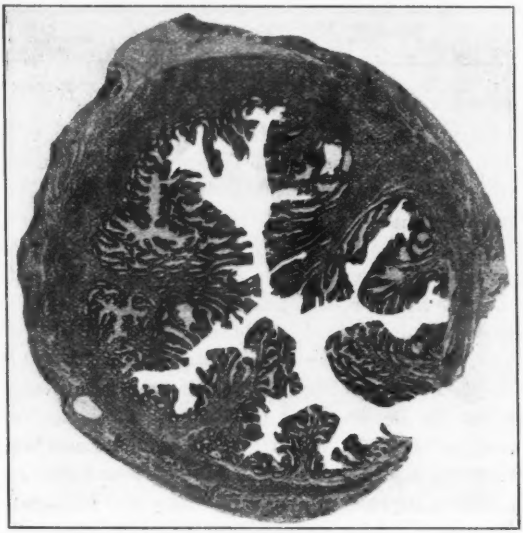

Fig. 6. Uterus at time of operation.

started 24 hours after operation; some were pregnant and unsuited, leaving 38 animals that could be utilized.

Of these 38, 5 received Hynson, Westcott & Dunning Corpus Luteum; 4 received Hynson, Westcott & Dunning Ovarian Substance; 5 received Hynson, Westcott & Dunning Ovarian Residue; 5 received Parke, Davis & Co. Corpus Luteum; 5 received

Parke, Davis & Co. Ovarian Substance; 5 received Parke, Davis & Co. Ovarian Residue; 5 received Wilson Laboratories Corpus Luteum. They received from 3 to 32 injections each, extending over a period of from 14 to 85 days after operation. The animals were killed by chloroform and the pelvic organs removed as well as the thyroid, adrenals, pituitary and breast.

In all cases the uterus showed atrophy. In the animals killed early the atrophy was not so marked (Fig. 1, 2, 3), as in those that were permitted to live for 2 to 3 months. The atrophy

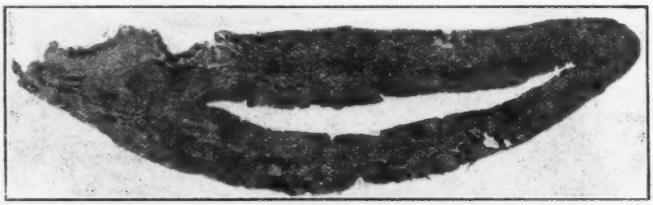

Fig. 7. Same as Fig. 5, 60 days after operation; 25 injections of Hynson, Westcott & Dunning Corpus Luteum.

involved the mucosa to the greatest extent (Fig. 4, 5, 6, 7). The villi disappear, the stroma, which is represented in most of them as a distinct entity, becomes markedly condensed. The glands disappear and the epithelium of the uterus is represented by one layer of cuboidal epithelium (Fig. 7a). The musculature also shows slight atrophy and a marked loss of tone, the organ changing its shape so that it becomes, instead of cylindrical, a collapsed tube flattened antero-posteriorly (Fig. 5, 7).

One interesting fact noted was that the cervix did not participate in the atrophy (Fig. 8) and it would seem probable that in the rabbit the development of the cervix was not controlled by the ovary. This, too, was true of the control castrates which had received no injections. It is also to be noted that in human subjects, after a supravaginal hysterectomy and bilateral oöphorectomy, the cervix does not undergo atrophy except when the women are near the menopause.

The gross appearance of the pelvic viscera after injection was rather characteristic:—the flattened, rather congested, atrophic uterus was situated in a broad ligament that showed an increased fat deposit.

The breasts, as the uterus, showed marked atrophy (Fig. 9-10). There is an actual diminution in the size of the

organ with a disappearance of the secretory gland tissue and a collapse and diminution in calibre of the ducts. The nipples are markedly shrunken and there is almost complete absence in them of the excretory ducts.

The pituitary gland did not show much change. There seemed to be an increased eosinophilia, but that could not be absolutely determined.

The thyroids of the injected cases appeared somewhat enlarged. In a few there was a tendency to formation of small

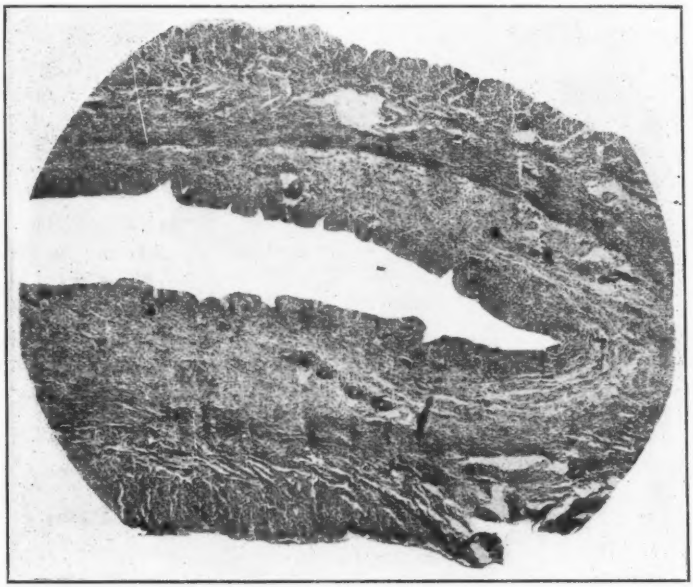

Fig. 7a. High power showing absence of glands, single layer of cuboidal cells lining uterus, condensation of stroma and slight atrophy of muscularis.

cysts. It is possible that this represents a tendency to hyperactivity and may have a bearing on the loss of weight that will be discussed later.

The adrenal showed some interesting changes (Fig. 11). In some there were areas of almost complete necrosis, not large, but scattered throughout the zona fasiculata. In others, definite areas of pale staining cells, containing fat, but very few nuclei.

These, too, were found in the fasiculata and encompassed 6-10 cells. Most of the adrenals show vacuolation and accumulation of fat in the individual cells. Somewhat similar changes were found in the controls, but not so constant nor so extensive.

The weight charts were interesting. The animals used varied in weight from 1.4 kilos to 2.1 kilos at the time of operation and, except for the few instances wherein the earlier stages we gave the injection too rapidly, the animals lost a definite fraction of their body weight. A loss of 0.4 kilograms in the larger

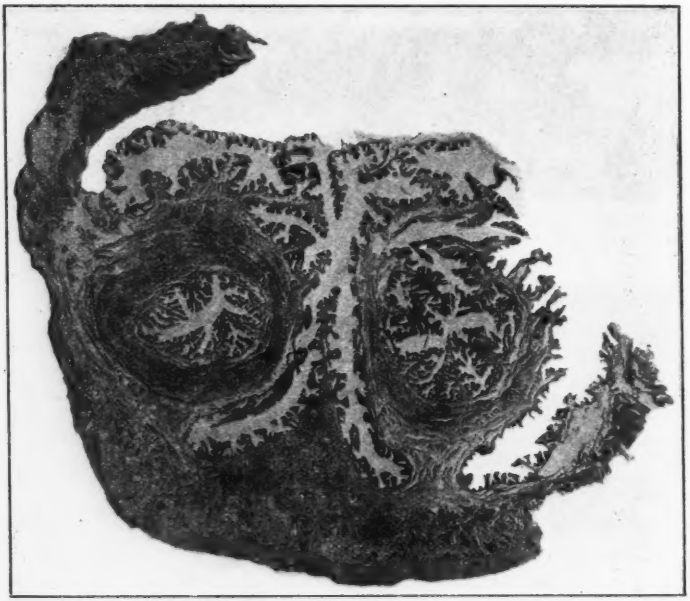

Fig. 8. Cervix showing no atrophy 60 days after castration; 25 injections of Parke-Davis Ovarian Residue.

animals was the greatest. The average was 0.3 kilogram or 16 per cent of their body weight. The controls, however, did not lose weight, the gain averaging 0.35 kilos or 11 per cent of the body weight. In other words, there was a decided influence on the maintenance of the weight, probably due to a stimulation of the basal metabolism. We are at present carrying on some experiments in the human female to determine, if possible, the

influence of the ovaries on basal metabolism. To explain this loss of weight we can only suggest that possibly the stimulant to the thyroid, with the resultant cyst formation, is reflected in an increased basal metabolism and this results in the marked loss of weight.

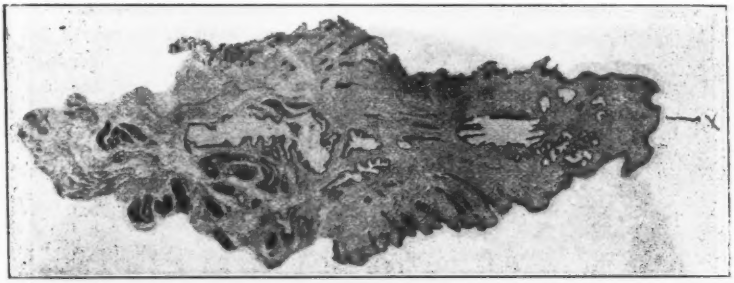

Fig. 9. Breast at time of operation. X marks nipple.

When we analyze our results we find that the injection of the several above-mentioned commercial preparations are unable to prevent the atrophy that follows castration in rabbits. The amounts given are easily the equivalent of the dosage exhibited to human subjects, and we conclude that there is nothing in these preparations, sufficiently active, that will substitute for

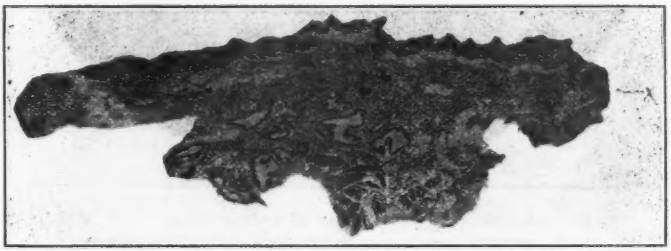

Fig. 10. Same animal as Fig. 9, 60 days after castration; 25 injections of Parke-Davis Ovarian Residue. Breast showing marked atrophy with absence of secreting glands and atrophy of nipple. X marks nipple.

the hormone that normally maintains the nutrition of the uterus. As these preparations represent all the active epithelial elements of the ovary, we can say that the active substance or substances are not solely situated in the ovary or that they may be destroyed in the preparation.

The cervix does not take part in this atrophy and it would appear more reasonable to suppose, not that the material used was the active factor in maintaining its normal status, but that the castration does not affect it, as can be demonstrated in our controls.

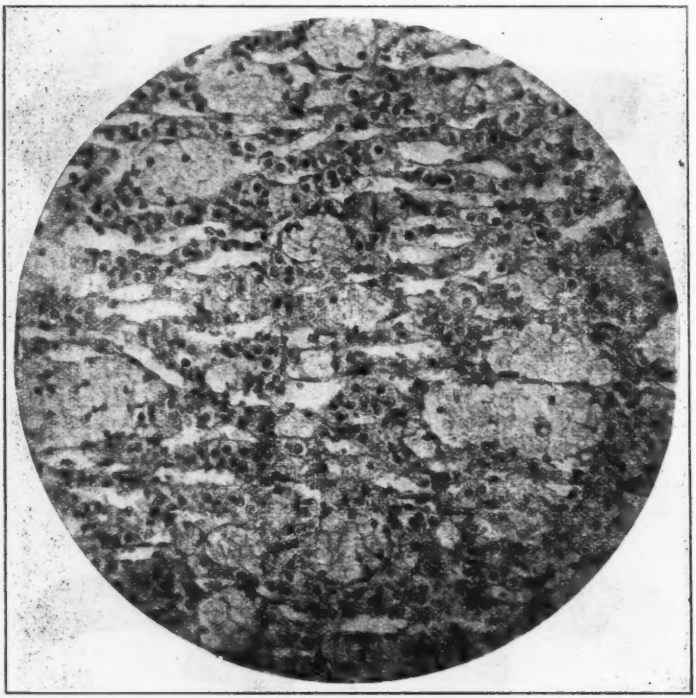

Fig. 11. Adrenal with focal areas of pale granular cells with few nuclei.

The breasts likewise undergo a complete atrophy which cannot be inhibited by the use of these commercial glandular extracts. This same atrophy takes place in the castrates not injected.

Finally, there are some slight histological changes in other glands of internal secretion the significance of which we cannot explain.

The weight constantly decreases, due, possibly, to the action of the preparations. No specific preparation showed itself more active than the others, in this regard.

From these experiments one can conclude that in rabbits the commercial preparations when given in fairly large dosage have no affect in preventing the castration atrophy of the uterus or breasts, but they do cause a definite decrease in the body weight.

We wish to thank Dr. J. Globus for his kindness in preparing the photo-micrographs.

A ROENTGENOGRAPHIC STUDY OF THE SELLA TURCICA IN NORMAL CHILDREN.*

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During the course of a roentgenographic investigation of the sella turcica in children of abnormal mentality, such as found in Mongolian idiocy, myxedema, etc., we soon discovered that a correct interpretation of the x-ray picture was impossible because of our lack of knowledge of what constituted the normal. In turning to the literature on the subject for aid, we were disappointed to find that very little information could be obtained, as the references were meager, consisting of Schuller's investigations some years ago and the more recent work of Jewett; the latter, however, being confined to a study of the normal appearance in the adult. There was nothing that could be found on the sella turcica of the normal child. Timme has published some observations on the appearance of the sella in abnormal children, but has not offered any sellas from normal children as a control.

This lack of literature on the subject in normal children prompted us to discontinue temporarily our investigations in abnormal children and to turn our attention to an attempt to determine, if possible, the size, shape and appearance of the sella turcica in normal children between the ages of 1 and 12 years and, in addition, to note the existence of any possible relationship between the size and shape of the sella and the size and shape of the head. The present study is based upon the x-ray examination of the heads of 104 normal children, ranging between 1 and 12 years of age.

From a roentgenographic viewpoint, the changes in different sellas are those of general shape, changes in the development and shape of the posterior clinoid processes, dorsum sellae and

* A complete description of this study will be found in N. York State J. M. (N. Y.), 1922, **22**, 54-58.

anterior clinoid processes. The middle clinoid processes are nearly constant in their shape and development.

The technic used in a study of this kind is important, not so much the exact method used, but the constancy with which it is followed. In adults, teleoroentgenography (films taken with the tube at 6 to 8 feet distance so as to obtain nearly parallel rays), is of course the most exact method. In children, however, the long exposures necessary in this technic are not practical. We have therefore selected a tube film distance of 26 inches and, by using a high penetration and milliamperage, have been able to obtain films with one-eighth second exposure. The tube carrier is so adjusted that the central ray passes along a line tangent to the cornea of both eyes and is then moved backward until the central ray passes through the head at a point about one-third of the distance from the external auditory meatus to the glabella. In most instances, this technic gives a good projection of the sella. One can readily imagine that in some rather badly trained children the following of any technic would be difficult even where only an eighth of a second immobility is required. Duplitized films and screens were used.

It was obvious even from a cursory examination of the films that there was no set normal for the general shape of the sella or for the appearance of the posterior clinoid processes and the dorsum sellas. For purposes of description many different classifications and groupings were tried, some based upon the anterior clinoid changes, some on the posterior clinoid changes and some on general shape. A classification following Jewett's 9 groups in adults was also attempted. None of these groupings and classifications was found feasible because only 50 to 60 per cent of the sellas could be definitely grouped, the rest being border line cases with some characteristics of one group and some of another. In other words, there were many sellas which could not be definitely grouped and would then have been placed in a miscellaneous class which would contain from 30 to 40 per cent of the cases, according to the strictness with which the groups were selected and would therefore be of no descriptive value.

We therefore have decided to classify our cases in 3 very general groups, depending upon the general shape of the sella turcica. In group A are placed those having a generally circularly shaped sella; in group B, those which are ovally shaped,

and in group C, those which are flattened or saucer shaped. Even with this very broad classification, it was not easy to place some of the cases between A and B groups. The rule was followed of placing in B all of those which were not definitely circular in shape.

In group A, the sella has a definitely circular shape, showing always a well developed curved or straight dorsum sellae and posterior clinoids. The anterior clinoids may or may not be developed, but usually are. The dorsum sellae varies markedly in weight and height and also in its shape. It may be very heavy and moderately short or very thin and high or may present a general conical appearance heavier at its base than at its tip. It may be of approximately the same weight at its base and tip, or it may show a bulbous tip which is heavier than the base. The anterior clinoid processes also show rather marked variations. In some instances, they are short, heavy and rounded, in others short, heavy and pointed; in still others, lighter in weight and longer. Occasionally one sees very heavy anterior clinoids which are also very long. In some instances the anterior clinoids are raised above the level of the middle clinoids and are very long. In these latter cases, a slit is seen running anteriorly from above the middle clinoid processes under the anterior clinoids. This slit is in no way a part of the sella. Where the anterior clinoids are rather prominent, the posterior processes may curve forward so as to give the appearance of bridging. This apparent bridging or close approximation of the clinoid processes occurs in about equal proportion in groups A and B. The floor of the sella in group A is necessarily circular in shape.

In group B, the floor of the sella is of oval shape. The posterior clinoid processes and dorsum sellae are always well developed and always curved. The anterior clinoids are almost always well developed and the middle processes usually definite. Both the anterior and posterior clinoids and the dorsum sellae are subject to the same variation as in group A except that the dorsum sellae is never straight.

In group C are placed those cases showing very shallow sellas, those which are very long in relation to their height. In this group also the dorsum sellae is poorly developed or absent and the posterior processes seem to be a part of the superior surface of the body of the sphenoid. The anterior processes may

be well developed, but usually are not. As in group A, in some instances, a slit may be seen running anteriorly from above the middle processes under the anterior; this slit is extra-sellar.

The measurements of the sella were obtained as follows: the length, from the middle clinoid process to the furthest part of the sella posterior; the height, on a line joining the tips of the anterior and posterior clinoid processes, a perpendicular was drawn to the deepest portion of the sella.

A study of the measurements shows a marked variation in the sella of each age. In the first year, varying from 6 by 5 to 9 by 7 mm. Another instance of variation is seen in the two larger measurements, 10 by 8, which occur in the sellas of 4 and 5 years. The smallest sella measured was in a girl of 9 years. The measurements of the sella practically always show a greater length than height, the average ranging from 7 mm. in length and 5.7 in height at one year to 9.2 mm. by 7.1 mm. at 11 years. We were surprised to find that the average length and average height were greater in the sella turcica of girls than in those of boys. We do not know if this is of any clinical significance.

There seems to be a rather rapid increase in size for the first two years and then a gradual increase up to 12 years with, however, much irregularity. The height measurements followed closely those of the length in average, except that they are proportionally smaller.

An analysis of groups A, B and C shows that all but two of group C cases fall in the first 3 years. This seems undoubtedly to be due to the fact that in some instances the dorsum sellae does not ossify early and, as it is not a bony structure at that time, does not appear to be present. Regarding the incidence of groups A and B, there seems to be no definite rule followed except that group A predominates at all ages except at 12 years.

An analysis of the three groups in relation to sex shows no influence of sex on the formation or appearance of the sella, for of group A there were 35 among males and 34 among females; of group B there were 11 among males and 13 among females; of group C there were 6 among males and 4 among females.

Head measurements were made of 50 cases. A careful survey of these and of the corresponding sella measurements seems to show definitely that there is no relation between the size of the head and the size of the sella. The head measurements were

designated and obtained as follows: anterior-posterior, from the glabella to the external occipital protuberance; anterior-posterior maximum, over the greatest length of the head; lateral, the distance between the squamous portion of the temporal bone just above and in front of the pinna; lateral maximum, the greatest bi-parietal measurements. All measurements were made with calipers.

An analysis of the relationship between the size of the head and the sella from the viewpoint of group, demonstrates that all of the group C's occur in small heads. But a small head does not necessarily contain a group C sella, for group C sellas were found in only 50 per cent of the heads measuring less than 17 cm. in length and 14 cm. in width.

CONCLUSIONS

Shape of the sella turcica. The sella turcica in normal children can be classified in a general way by means of the roentgenogram into 3 groups according to shape: A, circular; B, oval; and C, flat and saucer shaped, with modifications as explained in the text. Groups A and B were found in all ages, while group C was practically limited to the first 3 years.

Shape of sella as to size of the head. The shape of the sella has no significance except in the case of the flat group C type. This type is always found in small heads, but it does not necessarily follow that all small heads exhibit this type.

Size of sella in comparison with age of the child. There is a marked variation for each age, both as to height and length of the sella for that particular age. The average height and length of the sella shows a comparatively rapid increase in the first 2 years with a gradual yet irregular increase from then on up to the age of 12. There is a tendency for the average height increase to follow the average length increase.

Size of sella as to size of head. There is apparently no relationship between the size of the head and the size of the sella based on head measurements.

Appearance and size of sella as to sex. There is no difference in the occurrence of the three groups between the heads of boys and girls. There does not seem to be any influence of sex on either appearance or formation of the sella. The sella of girls, however, were greater in both length and height.

RELATION OF ONSET OF MENSTRUATION TO ENVIRONMENT

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It is generally conceded that girls in small towns and hamlets begin to menstruate later in life than girls in larger towns and cities. De Lee, in his text book on obstetrics, states, "The highly strung city girl has her periods early in life, the country girl, later. The poor overworked factory girl later—the rich girl early."

Hirsh, in his text book on obstetrics, states, "The environment of a girl determines the age at which menstruation begins. If she lives in a city, subjected to indiscriminate association with those of the opposite sex and the sexual temptation, the function appears earlier than in the country."

Osborne states, "Early menstruation has at present become more frequent because this is an age of excitement and nerve tension even for girls—anything that increases thyroid activity in young girls will hasten puberty and the thyroid activity is increased by sexual excitement."

These various views mirror the general opinion of the medical profession of the present day as to the onset of menstruation.

We have made a careful analysis of the menstrual histories of 800 consecutive women as they presented themselves in our (W. Lintz) private office practice. These represent the various social, economic and racial strata which compose our present society. Our findings show that the environment has less to do with the onset of menstruation than is generally supposed. It

seems to us that heredity plays a very important rôle which is tantamount to saying that the incretory organs are the underlying factors in the determination of puberty.

Girls of similar endocrine characteristics in a given family have a similar menstrual onset. In such a family all the girls need not necessarily begin to menstruate at a given age, because they happen to be in the same environment, but all those of similar endocrine heritage will do so, whereas those of dissimilar endocrine heritage will not, irrespective of environment. Several girls of a large family will begin to menstruate at the age of 13 or 14 years in a small town or on a farm—while the other sisters, brought to a large city such as New York, working in factories and stores, will begin to menstruate at the same age. In still other cases, one girl will begin to menstruate at 13 to 14 years on a small farm while another sister will begin at 17 or 18 years on the same farm. We have city girls beginning at 17 or 18 years and country girls at the age of 11 or 12 years. Relation of onset of menstruation between mother and daughter will depend upon their endocrinologic heritage rather than on any other factor.

We have attempted to tabulate our findings according to the age of onset of menstruation and according to the size of the community in which the subjects resided at that time. The first column includes scattered farms, hamlets, villages and towns up to about 3,000 to 4,000 population. The second column includes towns of 5,000 to 25,000. The third column includes cities of 50,000 or over.

ANALYSIS OF 800 CONSECUTIVE CASES

Age Onset of Menstruation.	Farms, Hamlets & Towns up to 4,000		Towns 5,000 to 25,000		Cities 50,000 and over	
	Percentage.	No. Cases.	Percentage.	No. Cases.	Percentage.	No. Cases.
12	1⅝%	13	2½%	20	3¼%	26
12 to 14.	35⅝%	285	6%	48	21⅞%	175
15	5%	40	3⅛%	25	5⅛%	41
16	2¾%	22	⅞%	7	5¾%	46
17	1⅞%	15	⅜%	3	1¼%	10
18 or over	1½%	12	¼%	2	1¼%	10
	Average age of onset of menstruation 13½ years		Average age of onset of menstruation, 13½ years		Average age of onset of menstruation, 14 years	

DISCUSSION

Our figures show that 62 per cent of 800 subjects began to menstruate at from 12 to 14 years of age; 35 per cent from 15 to 18 years of age, and 3 per cent after 18 years of age; of these,

two began at the age of 19 and one at 22 years of age. On the farms and in very small towns, the average age of onset of menstruation was approximately 13½ years. In the medium sized towns the average was 13½ years. In the large cities the average was 14 years. Contrary to the existing ideas, this fact shows that environment has nothing to do with the age of onset of menstruation.

It is also interesting to note that in Dr. D. F. Curjel's (1) analysis of 489 women representing many different casts and races in India, the average age of onset of menstruation was 13.63 years. This figure well corresponds with our figures quoted above, although the environment and climate of India is certainly different than in our own group of cases.

Certain specific cases quoted below are interesting examples which illustrate our point, that environment has little or nothing to do with the onset of menstruation.

Case 1: M. L., who lived in a Russian town of 5,000, began to menstruate at 17 years. She has four daughters. She moved to Brooklyn. Three of her daughters began to menstruate at the age of 12 and 13 years and one at the age of 17 years. This case shows that while the mother began late in a small town, one daughter began at the same age and three others at an earlier age in a large city. The determining factor of the onset of menstruation seems to be rather the heritage of similar incretory glands.

Case 2: The mother began menstruation at 14 years in a small Russian town of less than 2,000, while three daughters began in the large city of Brooklyn at a similar age of 13 years, 14 years and 14 years respectively. Hence this case, at least, shows there is no relationship between environment and menstrual onset.

Case 3: The mother began to menstruate at the age of 13 years in a Russian town of 500—contrary to previous ideas of late menstrual onset in small hamlets. She had two daughters who began at the age of 13 years in Brooklyn.

Case 4: M. P. began to menstruate at the age of 16 in Russian town of 10,000. Five daughters began to menstruate in Brooklyn at the age of 15 and 16 years. According to the present view they should have begun to menstruate in a city at a much earlier age. The mother weighs well over 300 pounds, the superfluous weight being possibly of endocrine origin.

Case 5: M. R. began to menstruate at the age of 17 years in Brooklyn. She had four daughters who began to menstruate in New York City at the age of 12 and 13 years.

Case 6: E. S. began to menstruate on a farm at 18 years of age.

Two daughters began to menstruate at the ages of 15 and 13 years respectively on the same farm.

Case 7: M. T. began to menstruate in a moderate sized city of Germany at the age of 18 years. One daughter began in Brooklyn at the age of 18.

Case 8: T. T. began to menstruate at 16 years in a town of 1,000. One daughter began at 12 years in New York City, and three daughters began at 16 and 17 years respectively in New York City.

CONCLUSIONS

These examples are merely taken from a long list of similar cases. They are consecutive cases and represent the poor girl as well as the rich girl, the farm girl as well as the city girl, the school girl as well as the factory girl, the idle girl as well as the working girl, the secluded girl as well as the society girl; all are white girls, but of various nationalities and races. A careful search in all these cases failed to reveal that environment had the slightest influence in determining the onset of menstruation.

Our data shows that regardless of the size of the town or city and of the environment, the average age of menstruation remains approximately the same—13½ years.

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REGENERATION AND TRANSPLANTATION OF THE THYROID

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The following study has been compiled from notes and material left by the late E. R. Hoskins. Most of the material used is from experiments made by him in the spring of 1919, at the University of Pittsburgh, but a few specimens from our earlier work on tadpoles have been used also: The experiments consist of two types of transplantation of the thyroid, and have been grouped together in the hope that they may throw some light on the relation of this gland to metamorphosis.

Some questions were raised by our earlier paper on thyroidectomy (1919), which we could not answer at that time. One was as to the effect of hyperplasia of the gland following incomplete extirpation. One of the tadpoles from that series of experiments metamorphosed at an early date, when it was only about half the size of a normal tadpole at its period of metamorphosis. On examination this animal was found to have a regenerated thyroid which was, in proportion to the size of the animal, several times as large as the normal gland. We supposed that the precocious metamorphosis of this frog was due to its having so great an amount of thyroid tissue, but none of our subsequent experiments have produced a similar result. However, the first two sets of experiments to be described in this paper show some relation between the amount and character of the thyroid tissue and the rate of development.

Another set of experiments was planned with a view to determining whether the thyroid influences directly other phases of metamorphosis besides the skeletal changes involved. In earlier work on this subject we suggested that the metamorphosis of the thyroidless tadpoles was prevented primarily by interference with the calcium metabolism. The transformation to the adult form is a series of steps of which skeletal development is the first, and if the first step be prevented, the later ones may not take place. It is possible that the atrophy of the tail and

other changes involved in metamorphosis would take place in the absence of the thyroid if the skeletal development were normal.

MATERIAL AND METHODS

The animals used in these, as in former experiments were the larvae of Rana sylvatica. The operations were performed when the larvae were about 6.5 mm. long, before the thyroid had begun to function. The technique does not need any special description, as it was the same as that previously used and described. Specimens were preserved, usually in Bouin's fluid, and sectioned and stained in the ordinary way.

I. *Regeneration of the thyroid.* Although we have made many attempts to repeat the procedure of 1917 which led to the hyperplasia of the regenerating thyroid and the precocious metamorphosis of the frog, we have never succeeded in obtaining that result again. Cutting the anlage of the gland to bits and leaving the fragments in the animal does not lead to hyperplasia of the organ nor to precocious metamorphosis. A study of the regenerated tissue shows, however, that there is in some cases a hypertrophy of the thyroid which may be correlated with the rate of development of the animal. This condition of the gland and its relation to metamorphosis are illustrated in figures 1 to 5, and 11 to 19. Figures 1 to 5 represent animals in which the thyroid has regenerated, and it will be seen that they are in different stages of development, although all but the last two were fixed at about the same time. The first (fig. 1) is a larva which has grown beyond the size of a normal tadpole at its maximum (cf. fig. 6), but has also developed beyond the condition reached by a thyroidless tadpole (cf. fig. 7). Had it been entirely thyroidless, it would not show so much development of the hind legs as it does. This larva was fixed on the 15th of June, when all the other animals of the series had completed their metamorphosis. Figures 2 and 3 show tadpoles with regenerated thyroids in which metamorphosis is well started. They have developed at the normal rate, and show no peculiarities unless examined microscopically. In figure 4 is shown a specimen which is about to undergo metamorphosis slightly in advance of the controls. It is, however, normal in size and appearance, and is only about two weeks ahead of the controls (fixed in this condition on May 10th). The last frog of this group is the pre-

cocious frog of the 1917 series, reproduced here to scale with the other drawings. This animal, as has been said, underwent metamorphosis a full month before the controls, at a time when it was but half the size of the normal tadpole at maximum.

Examination of the regenerated thyroids of these animals shows that two factors are important in the influence of the glands on the rate of development. One is the amount of the regenerated tissue, and the other is the character of its elements. Certain of these glands show a striking hypertrophy and where this is present a very small amount of the tissue is sufficient to make the animal develop at a normal rate or even a little faster than is normal. This hypertrophy is illustrated (figs. 11 and 12) in the thyroid from the frog shown in figure 4, which has begun metamorphosis a little ahead of the control animals. The follicles of this thyroid are abnormal in size and shape, so that even under the low power of the microscope their abnormality is apparent (fig. 11). The follicles of a normal thyroid (fig. 13) are round or oval in shape and do not have irregular folded walls like those seen in the regenerated gland. A closer examination of the latter shows that the epithelium is not of the normal type. Epithelia from normal thyroids are illustrated in figures 14 and 15, which represent the extremes of variation under normal conditions from a low, flattened cuboidal epithelium with indistinct cell-walls to a high cuboidal with lighter cytoplasm and clear cell-walls. One does not find in normal specimens any such epithelium as is illustrated in figure 12 (an enlargement of part of figure 11) where the cells are of the columnar type.

This hypertrophy of the thyroid is found in those animals which are developing at a normal rate with a very small mass of thyroid tissue, the activity of the cells compensating for their small number. Besides the animal from which the drawings were made, the one shown in figure 2 has a thyroid of the same kind. It has the same kind of epithelium lining the irregular follicles, and is very small. Specimens of the same sort were found in our earlier experiments also.

Not all of the animals in which regeneration of the thyroid has taken place show this hypertrophy of the gland, however, and where it is lacking the amount of the tissue is important in determining the rate of development. This is illustrated in the

three specimens shown in figures 1, 2 and 5, which had varying amounts of normal thyroid tissue. The first has a small amount of thyroid the character of which is shown in figures 16 and 17. The epithelium is flat, but not lower than that found in some normal thyroids (fig. 15). The follicles are of the normal size and shape, but few in number. The figure represents the largest transverse section of the gland, of which but one was present. The thyroid of the animal represented in figure 2 is normal in appearance. That of the precocious frog shown in figure 5 has already been described (Hoskins and Hoskins, 1919), but may be reviewed here. The epithelium is normal (fig. 18), but the amount of the tissue is abnormally great when the size of the frog is taken into account. Figure 19 shows a sagittal section through one of these large glands, of which both have regenerated. The cells lining the follicles are large and appear to be secreting actively, but they are hardly outside the limits of normal variation, and it is evident that if the precocious metamorphosis of the animal was due to the thyroid at all, it is caused by hyperplasia rather than by hypertrophy of the organ.

II. *Transplantation.* In the second series of experiments thyroid anlagen were transplanted from one tadpole to another, with the expectation that these animals with a large amount of the tissue would show the same precocity as the frog with the hypertrophied gland. Although the expected effect was not produced, the results of the experiments called our attention to an interesting point regarding the relation of the thyroid to skeletal development. The animals in question did not reach the stage of metamorphosis earlier than the controls, and it was only on examination of preserved material that any abnormality was observed in them. A number of animals were fixed at the stage just preceding the shrinkage which takes place during metamorphosis, and these were found to have a peculiar shape, as is shown in figure 8. The swollen abdomen suggested at first some abnormality of the viscera, but dissection showed these to be normal. Further examination showed that the development of the skeleton is responsible for the unusual appearance of the animals. The skeleton of the head has developed toward the adult condition faster than the viscera, with the result that the latter are forced out of the narrowed anterior part of the body. This is seen even more clearly in the side view (fig. 9),

and the ventral view (fig. 10) shows that the fore legs are already visible through the skin, although they are not to be seen in the normal specimen at this age. The interest of the set of experiments lies in the clear demonstration afforded that the first effect of hyperthyroidism in the tadpole is upon the skeleton. Other parts of the body appear normal and the tissue of the thyroids and the grafts is of the normal sort, showing no hypertrophy.

III. *Transplantation of the thyroid to the tail.* A still further proof of the relation of the thyroid to skeletal development is given by the third set of operations. In these the thyroid anlage was taken out of its normal position and planted in the tail. The animals developed normally up to the maximum length. When they had reached the stage just preceding metamorphosis, the tails, including the thyroid grafts, were cut off, thus removing the gland after it had functioned for some time. The plan was to see if the tadpoles which had had their thyroids through the period of skeletal development could complete metamorphosis in the absence of the gland. Two facts are demonstrated by these experiments. One is that the thyroid is not directly necessary for the later stages of metamorphosis if it is present till the animal has reached its maximum size. The other is that the presence of a graft in the tail greatly increases the likelihood of regeneration of thyroid in the normal situation. In other thyroidectomy experiments the percentage of regeneration has been from two to ten per cent, while among the animals with thyroid grafts seventy-five per cent showed regeneration of the gland in the normal situation. Microscopic examination of specimens showed that the condition may vary all the way from that of an animal in which the graft in the tail has been resorbed and the gland has regenerated in the normal position, to that in which there is a large graft in the tail and no thyroid tissue remaining in the body after the second operation. There seems to be a connection between the development of the graft and the regenerated gland. When the latter is large and healthy, the graft is usually resorbed. The grafts in those animals in which there was no regeneration were all large, and some of them showed a marked hypertrophy with tall columnar epithelium and very large irregular follicles.

DISCUSSION

The results obtained from the experiments described fall under two heads: the relation of the amount and kind of thyroid tissue to the rate of development, and the relation of the gland to different phases of metamorphosis. Precocious metamorphosis and delayed metamorphosis have been noted by other observers occurring naturally among the tadpoles kept in the laboratories. Jensen (1921) has made a study of a few such cases. He reports that out of seven cases of precocious metamorphosis four show enlarged thyroids and three do not. One gathers from the illustrations, however, that the three animals in which the thyroids were said to be small were themselves below the normal size, and it seems at least possible that the glands were relatively large. No hypertrophy is evident from the figures. Probably, however, some other factor than the size of the thyroid is involved in the production of precocious frogs. We have never been able, in spite of repeated attempts, to induce metamorphosis more than two weeks ahead of the normal time, except in the single instance already described. The size of the gland has some effect on the rate of development, but the effect in the precocious frog seems disproportionate to the amount of hyperplasia.

The possibility that the thyroid is concerned chiefly with the skeletal changes of metamorphosis has already been suggested by us and by Allen (1919). Allen notes that in Bufo the limb development and the disappearance of the tail follow the accumulation of the colloid in the thyroid; but since the tail disappears during the period when there is actual diminution of the gland, he suggests that this feature of metamorphosis is independent of the thyroid. The other possibility is that it may occur as the result of the accumulation of a considerable amount of colloid, though no more is added while it takes place. The experiments which we planned in 1919 to test this particular point are not absolutely conclusive by themselves. Metamorphosis may be completed after complete removal of the thyroid, if this removal takes place when skeletal development is well advanced, but there is the possibility that it does so through the agency of hormones remaining in the body after the gland has been removed. The period during which the animal continues to develop normally after the removal of the thyroid is

not a very long one (about three weeks) and it is possible that if the process of metamorphosis had lasted longer a different result would have been obtained. The results of other transplantation experiments, however, favor the view that the skeletal changes of metamorphosis are the only ones to be influenced by the thyroid, for in them we saw that the result of hyperthyroidism was visible in the shape of the head and the development of the fore limbs while the shrinkage of the tail and the viscera were delayed until the normal time of metamorphosis.

SUMMARY

1. The epithelium of regenerating thyroid glands may undergo hypertrophy, resulting in abnormally shaped follicles lined with tall columnar epithelium. A very small amount of this abnormal tissue is sufficient to cause the animal to develop at the normal rate.

2. In the absence of this hypertrophy, the rate of development varies with the size of the regenerated gland.

3. Precocious metamorphosis was not caused either by allowing the thyroid to regenerate or by engrafting additional thyroid tissue. Although precocity is accompanied by a relatively large thyroid, it is probable that some other factor is involved in its production.

4. The effect of the presence of grafts of thyroid tissue is visible only in an advance of skeletal development. Metamorphosis is not hastened by the operation.

5. The results of these experiments illustrate the difference between the effect of thyroid feeding and of hyperthyroidism.

6. Animals which are deprived of their thyroids just prior to the normal time of metamorphosis, when the skeletal development is well advanced, are able to complete the transformation to the adult form. It appears that the later changes of metamorphosis are independent of the thyroid.

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PLATE I

Figure 1. Tadpole with regenerated thyroid: development retarded.

Figures 2-4. Tadpoles with regenerated thyroids: development normal.

Figure 5. Precocious frog.

Figure 6. Thyroidless tadpole.

Figure 7. Normal tadpole at maximum.

Figure 8. Tadpole with thyroid graft.

Figure 9. Lateral view of tadpole with thyroid graft.

Figure 10. Ventral view of same.

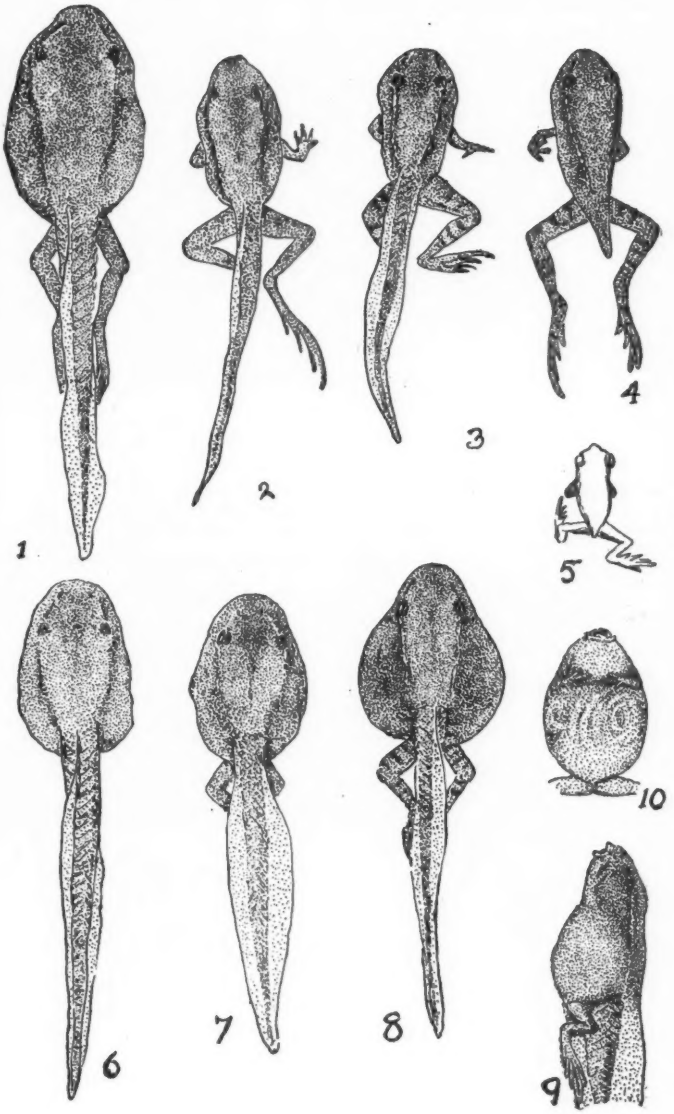
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PLATE II

Figure 11. Regenerated thyroid showing hyperplasia.

Figure 12. High power drawing of the same.

Figure 13. Group of follicles from normal thyroid (same magnification as Fig. 11).

Figures 14 and 15. Epithelium of normal thyroid showing limits of variation in the height of the cells.

Figure 16. Epithelium of regenerated thyroid in which there was no hyperplasia.

Figure 17. Follicles of small thyroid without hyperplasia (largest section of the gland).

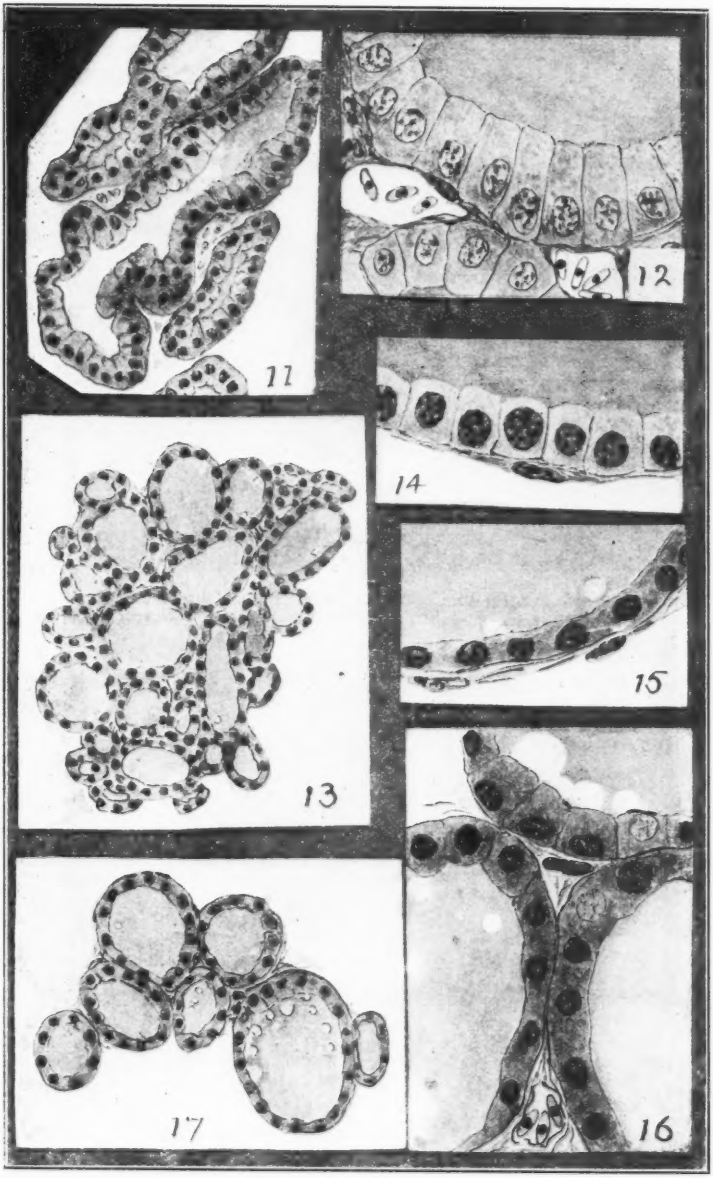
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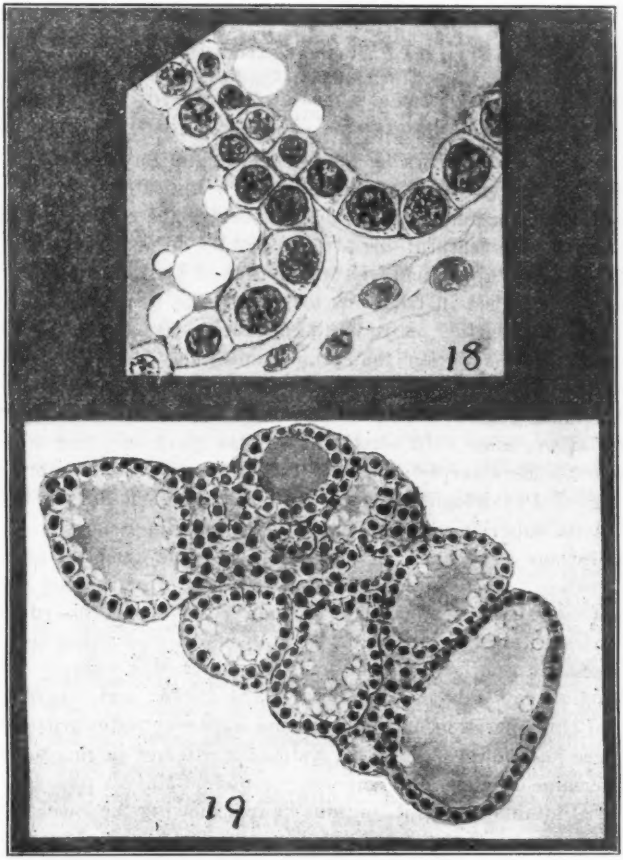
PLATE III

Figure 18. Epithelium from thyroid of precocious frog.
Figure 19. Largest sagittal section of thyroid of precocious frog.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THE EFFECT OF THE ABLATION OF THE SUPERIOR CERVICAL SYMPATHETIC GANGLIA UPON THE CONTINUANCE OF LIFE

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Some recent work by Meltzer (1920) on the ablation of the superior cervical sympathetic ganglia indicates that certain common laboratory animals do not survive the removal of these bodies. This careful investigator found in a large series of animals that approximately 90 per cent of his experimental animals succumbed in from one to ten days to this operative procedure, exhibiting on death pulmonary lesions. It was suggested by this worker that these results may have been due to an endocrine function exercised by these ganglia.

These results, whatever may have been the cause of death, are at variance with somewhat similar work of other investigators. E. Sharpey Shafer (1919) demonstrated before the English Physiological Society two rabbits, each of which had had its superior cervical sympathetic ganglia removed in two operations a week apart, one ganglion being removed at each operation. These animals were alive weeks after the last operation had been performed. In man removal of the superior cervical sympathetic ganglia as a means of alleviating the distressing exophthalmic symptoms of goiter was suggested and practiced by Jaboulay (1896). Mayo (1914) and others have used this operation on man with no apparent untoward effects. There has, however, been no systematic attempt in this work to determine whether ablation was complete. Mayo's paper is the most illuminating, as it contains figures showing the location and the exposure of the ganglion. He seems to have no doubt that removal was complete in several cases but, obviously, histological proof of removal could not be offered.

As Meltzer's is the most extensive work so far performed for the distinct purpose of demonstrating the effects upon life of ablating these ganglia, it deserves a fuller review at this time.

His series comprised twenty-eight rabbits and three cats. Six of his rabbits died in less than 24 hours, nine in less than two days, five in less than three days, and five others within ten days of the operation. Two cats died within two days. All of these animals at autopsy showed pronounced pulmonary lesions. Three rabbits and one cat survived. These four animals were examined by his physiological test (the "paradoxical" eye reflex test). One rabbit and the cat gave a negative test, which was taken to indicate that ganglionic tissue was present. The remaining two rabbits gave a positive test. The survival of these animals Meltzer has attributed to the possible presence of a minute amount of ganglionic tissue.

Because of the divergence between the results of Meltzer's work and that of other investigators it was felt that the subject deserved a careful re-examination.

In my work three types of experimental animals were used, namely, rats, rabbits, and cats. The rats were of young, healthy stock, especially selected. Young as well as old rabbits were purposely chosen for the work. The cats also varied considerably in age as will be seen from the tables. Great care was taken in the hygiene and care of the animals. The operative work was done during the months of February and March, 1921.

OPERATION

After exposure of the upper portion of the vago-sympathetic chain the sympathetic was carefully separated from the vagus in the cephalic direction until the superior ganglion was reached. This ganglion was then separated from the adjoining vagus ganglion. In effecting this separation considerable difficulty was experienced in the cats in which form, as is well known, the two ganglionic bodies are intimately associated. In the rats this association is less intimate, while in rabbits they are definitely separated. In no form did this association preclude a complete separation of the two ganglia, and the ablation of the sympathetic ganglion as was subsequently determined by histological study (see table). After this separation had been effected the dissection was carried further cephalad until the upper sympathetic roots were found. These fibers were then carefully pulled loose from their cephalic attachments, the sympathetic nerve sectioned about a centimeter below the ganglion, and the latter removed.

All of my animals recovered, save one cat, which showed continued signs of snuffling and finally died eleven days after the operation. After recovery from the immediate effects of the operation, except for this one animal, no ill effects upon the

	Age	Sympathetic ganglionic tissue; histological examination		Time between operation and sacrifice of animals	Condition of lungs	"Paradoxical" eye reflex test
		Right side	Left side			
Rat 1	117 days	Present	Present	17 days	No examination	No examination
Rat 2	120 days	Absent	Absent	14 days	No examination	No examination
Rat 3	120 days	Absent	Absent	14 days	No examination	No examination
Rat 4	100 days	Absent	Absent	20 days	No examination	No examination
Rat 5	100 days	Absent	Absent	20 days	No examination	No examination
Rat 6	100 days	Absent	Absent	20 days	No examination	No examination
Rat 7	107 days	Absent	Absent	19 days	No examination	No examination
Rat 8	107 days	Absent	Absent	19 days	No examination	No examination
Cat 102	Young female	Absent	Absent	56 days	Consolidated areas right lung	Positive
Cat 103	Male 1 year	Absent	Absent	58 days	Normal	Positive
Cat 104	Six months	Doubtful*	Absent	68 days	Normal	Positive
Cat 105	Eight months	No examination	No examination	11 days Died	Congestion lower half both lungs	No examination
Cat 106	Old animal	Absent	Absent	40 days	Normal	Right positive, left blind
Cat 107	Old animal	Absent	Absent	38 days	Normal	Negative
Rabbit 1	Old animal	Present	Present	49 days	Congestion and aeriation upper right	Positive
Rabbit 2	Young animal	Absent	Absent	42 days	Normal	Positive
Rabbit 3	Young animal	Absent	Absent	39 days	Normal	Positive
Rabbit 4	Young animal	Absent	Absent	30 days	Normal	Positive

*A group of nerve cells were found whose connections were doubtful though the examination seemed to indicate that they were vagal rather than sympathetic.

health of any of the animals were noted. The animals, however, showed the eye effect characteristic of sympathetic section.

PHYSIOLOGICAL TEST OF RESULTS

Not less than 48 hours after the operation the cats and rabbits were tested for removal of the sympathetic ganglia by the "paradoxical" eye reflex method (Meltzer, 1904; Meltzer and Auer, 1904). (The difficulty of seeing the pupil prohibited this test in the rat.) The test consists of instilling adrenalin, 1:1000, into the eye or of injecting 1 to 3 cc. of adrenalin, 1:1000, subcutaneously. The instillation method works well on rabbits, while the injection method is the most satisfactory for cats. Distinct dilatation of the pupils with this treatment indicates a complete removal, according to Meltzer (1904).

Thus, sectioning of the sympathetic nerve or an incomplete removal of the superior cervical sympathetic ganglion did not elicit a positive response (test); complete removal did elicit such a response, according to this investigator. In his latest work, Meltzer (1920) admitted that two of his animals which gave the paradoxical response survived and because of this he was inclined to believe that a positive response does not necessarily mean a complete ablation, though it does show a nearly complete removal.* It must be recognized, however, that Meltzer's conclusions are not supported by microscopical examination of the tissue of this region for ganglionic remnants.

All of my cats and rabbits were examined by the "paradoxical" eye reflex test, and all of them except cat No. 107 showed dilatation of the pupils. Histological examination demonstrated the absence of any ganglionic tissue in this animal.

The suggestion given by Meltzer (1904) that when using the subcutaneous method, the dosage should be 1 to 3 cc., varying with the size of the animal, may throw light upon the results obtained with the above mentioned animal (cat No. 107) when submitted to the eye test. Two cc. were used on this cat, which was an unusually large animal, and no doubt the dosage was too small to elicit the dilatation response. I may say, therefore, that although the test may help demonstrate successful ablation,

* One of my animals seems to lend support to this contention, for rabbit No. 1, though giving a positive eye test, showed histologically the presence of quite a definite amount of sympathetic ganglion tissue on each side.

as it is used at present, it seems that it cannot be counted upon to give any absolutely conclusive results.

AUTOPSIES

Proof of ablation then must be histological and not physiological, and it would seem, as previously stated, that it is unfortunate that Meltzer must admit that in his work "no macroscopical or microscopical examination" was made. In my work the animals after the operation were permitted to live for a period of two weeks to two months. They were then killed and autopsied. Especial attention was given to the lung examination, and to an examination with the binocular microscope of the region of operation for the purpose of detecting any remaining ganglionic tissue gross and distinct enough to be determine by this means. The carotid artery and vagus nerve were then picked up and sectioned well below the region of the vagus ganglion. Dissection of these structures, together with all surrounding connective tissue, was carefully carried to the base of the cranium, from which all connective tissue was loosened. The carotid and vagus were cut as they entered the cranium, and the tissue was then removed and fixed in 10 per cent formol. Microscopical examination was made upon all of the animals reported save one (see table). This examination showed complete ablation of the ganglia from seven rats, four cats and three rabbits, all of which survived. With the exception of cats No. 102 and No. 105 and rabbit No. 1, the lungs of all of these animals were normal.

DISCUSSION

The conclusion, then, seems inevitable that the death of Meltzer's animals was not due to the complete ablation of these ganglia. For, as must be emphasized, all of my experimental animals save one survived, and this animal seemed never to recover from the immediate effects of the operation. Autopsy showed pulmonary lesions. It would appear, therefore, that Meltzer's two surviving rabbits more nearly represent the effects that can be expected from complete ablation than do the twenty-five animals which succumbed, death supposedly being due to the loss of the ganglia.

That the lesions found by Meltzer were not due to vagal interference is shown by the careful controls which he made to

cover this point. In advancing an explanation for the cause of the death of these animals he states, "From the foregoing evidences, I am inclined to conclude that the death of the animals in which both ganglia were removed was due to the removal of these organs—if I may call them so—and not due to the procedure of the operation. In other words, the superior cervical ganglia contain a principle which is essential for the maintenance of life" (Meltzer, 1920).

The suggestion of Meltzer that the superior cervical sympathetic ganglia elaborate a principle essential to the maintenance of life was supported by a series of four rabbits whose ganglia had been pulled loose from their cephalic connections, but not ablated. In these experiments, in addition to leaving in place the ganglia which he had thus freed, he also transplanted two foreign superior cervical sympathetic ganglia from other rabbits to each of these animals. These four animals survived, which led him to conclude that the superior cervical ganglia might elaborate an essential endocrine substance. All the evidence gathered from my own work speaks against this conclusion. Nor does the ascribing of a specific endocrine function to any part of the sympathetic system find support when the embryological development of this system in general is considered (Keibel and Mall, 1912), for we see from such a study that the whole system develops similarly from the neural crest. If, therefore, we are to ascribe an endocrine function to one part of the system it is hardly logical to deny the same function to the other parts. Accordingly, the removal of a single pair of these ganglia would not deprive the animal of a sufficient amount of this secretion to cause its death.

CONCLUSION

Our experiments on the ablation of the superior cervical sympathetic ganglia, which have been carefully checked up by histological study, have demonstrated that rats, cats and rabbits will survive their complete removal.

The fact that these animals survived complete removal of the ganglia argues against the conclusion that these bodies have an endocrine function essential to the continuance of life.

Embryological development of the superior cervical sympathetic ganglia does not seem to set them apart from the rest of

the sympathetic system as organs which might possibly have an obscure endocrine function.

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THE EPINEPHRIN CONTENT OF COMMERCIAL SUPRARENAL "CORTEX" PREPARATIONS

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As a result of the recent work on the thyroid-suprarenal cortex relationship (1) and more particularly that of Shapiro and Marine (2) and subsequently of others, the use of suprarenal cortex as one of the measures employed in the treatment of Graves' disease, is increasing. A number of commercial preparations of suprarenal cortex have recently appeared on the market.

It has been found that whole suprarenal gland, administered orally, causes nausea and vomiting in both man and lower animals. This is due to the epinephrin present. In view of the technical difficulties involved in separating cortex from medulla on a large scale and also because severe gastro-intestinal symptoms did result from the daily administration of 0.5 gram of a commercial suprarenal cortex preparation, it seemed advisable to determine whether these preparations contained significant amounts of epinephrin.

Shapiro and Marine used large doses of fresh suprarenal cortex (30 grams daily) or corresponding quantities of a glycerol emulsion, in the treatment of these patients. They found several desiccated preparations which they used comparatively ineffective. Nevertheless, it would, of course, be highly desirable to have a non-toxic, dry, active, stabile preparation available.

At least some, and probably all, of the products that can be purchased on the market are defatted by extraction with gasoline. This prevents them from becoming rancid. In the present state of our knowledge, however, it is a most pertinent question as to whether this extraction process does not remove or alter some physiologically active constituent of the glands. Further, since all of the marketed preparations examined contain considerable amounts of epinephrin, sufficient even in the small doses recommended (compared with those used by Shapiro and Marine, which are ten to thirty times as great) to cause untoward effects,

the advisability of using them at present is extremely questionable, especially in Graves' disease.

Seven specimens, purchased in different places and prepared by three firms, were examined for their epinephrin content by the method of Folin, Cannon and Denis (3) as modified by Seidell (4) for desiccated preparations. The analytical data are presented in Table I.

TABLE I

	Dosage Recommended	Epinephrin Content, Per Cent
Armour "Suprarenal Cortex, Desiccated," powder	1 to 3 grains three times a day.	0.80
Armour "Suprarenal Cortex, Desiccated," tablets		0.41
Armour "Suprarenal Cortex, Desiccated," tablets		0.44
G. W. Carnrick "Suprarenal Cortex, Desiccated"	Average dose 1 to 2 grains 3 or 4 times daily.	1.09
G. W. Carnrick "Suprarenal Cortex, Desiccated"		0.97
G. W. Carnrick "Suprarenal Cortex, Desiccated"		1.11
Marvell Pharmacal Co. Empco Brand Glandular Products "Adrenal Cortex"	Average dose 1 to 2 grains 3 times daily.	1.53

The amounts of epinephrin present vary from 4.1 to 8.0 mg. per gram of dry substance in the Armour preparations, 9.7 to 11.1 mg. per gram of substance in Carnrick preparations and 15.3 mg. per gram of substance in the Marvell Pharmacal Co. preparation.

In addition to these products, the so-called nucleoprotein of whole suprarenal gland, manufactured by Schiefflin & Co., according to Rogers (5), was analyzed and found to contain only traces of epinephrin.

If the doses recommended on the labels of the various products were used, the following amounts of epinephrin would be ingested daily:

Armour ..... 0.8 to 5.8 mg.
G. W. Carnrick ..... 2.6 to 5.9 mg.
Marvell Pharmacal Co. ..... 3.1 to 6.1 mg.

Whole desiccated ox suprarenal contains, according to Seidell (4), from 6.4 mg. to 9.1 mg. of epinephrin per gram of

substance (probably defatted), with an average value of 8.0 mg. per gram in four commercial preparations. Fenger (6) reports the average epinephrin content of 200 desiccated defatted suprarenal glands from full grown cattle to be 25 mg. per gram of substance and somewhat higher values in the case of young calves. From these data it is evident that only a partial separation of cortex from medulla has been effected in any of the preparations examined.

It is well known that the effect of the same dose of epinephrin on different persons varies greatly and that certain individuals are hypersensitive to very small doses even when given by mouth. The medical profession should, therefore, bear in mind that when prescribing the suprarenal cortex preparations now obtainable, they are recommending the ingestion of considerable amounts of epinephrin along with the glandular product.

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A CASE OF RAYNAUD'S DISEASE, RECOVERED

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Mr. A., a Hebrew of 39, was a truck driver up to the age of 23, later a tailor.

Family History: The father died at the age of 69, the mother at the age of 54; the causes of their deaths were unknown to the patient. One brother died from an accident; 4 brothers and 3 sisters were living and well. No disease similar to the patient's ever occurred in the family.

Patient's History: The patient's general health had always been good; he did not remember having had any childhood diseases; his boyhood had been exceptionally healthy and devoted to athletics. He married at the age of 25, but had no children. His head, eyes, ears, nose and throat had never caused him any trouble. He had no chronic cough and was not subject to colds. He was not easily tired. His appetite was fair, his digestion good, his bowels regular. He denies any venereal infection; he had no dysuria nor nocturia. He went to a Jewish school from the age of 4 to 13. He was of normal mentality. His habits were excellent (no alcohol, tea, coffee, or tobacco). He used to sleep very well and, whenever possible, for long hours; during his illness, however, his sleep was much disturbed by the pain he suffered.

Present Illness: In February, 1921, the patient began to experience a sort of an itching pain, as he describes it, in both hands. This pain, situated at first in the palms of both hands at the bases of fingers, later extended to the fingers themselves. It was not paroxysmal in character, but continuous, becoming progressively more and more intense.

There were no objective changes visible until four months later, when both hands became hyperemic, dark purple. Half a year later, that is, in August, 1921, the left third finger broke down and later the right thumb.

The patient was under morphia for several weeks before he came to see me. He changed residence and doctors frequently and late in September, 1921, came under my care.

Physical Examination: He was a well built, well nourished man (5 feet 5½ inches in height and weighing 150 pounds). He was very pale, almost muddy in color, evidently very exhausted, nervous and trembling. His pupils reacted to light and accommodation. His head, eyes, ears, nose and throat were normal. He had a bridge in the

mouth with two crowns. His gums were normal. The cervical glands and thyroid were not palpable. The lungs were normal to percussion and auscultation. The cardiac apex was in the fifth interspace 10½ cm. from the midsternal line. The tones were clear, with no murmurs. P2: A2. The blood pressure was 98-70. The pulse was 96 and of a fair quality. There were no masses in the abdomen and no tenderness nor resistance. The spleen and kidneys were not palpable. The reflexes, especially the deep ones, were greatly exaggerated. There was no general glandular enlargement. His feet were perfectly normal. Both hands were markedly hyperemic, his fingers almost black-purple. The third left finger and right thumb were necrotic (dry necrosis). No distinct demarcation line was present.

Laboratory Findings: The urine was a clear, dark amber color, with a specific gravity of 1020 and acid reaction; it contained no albumen and no sugar. The Wassermann test was absolutely negative with all three antigens (plain alcoholic, cholesterinized and Noguchi's acetone insoluble). His blood tested: hemaglobin, 75 per cent (Sahli); erythrocytes, 4,800,000; leucocytes, 7,600. There was withdrawn 4 cc. of perfectly clear spinal fluid, colorless and under normal tension. The cell count was 4. The globulin was not increased. The Wassermann test was absolutely negative. A provocative dose of Neosalvarsan was given, followed by 3 consecutive negative Wassermanns.

Special Examinations: Ophthalmoscopic examination revealed a normal fundus.

Therapy: The patient was sent to Multnomah Hospital. He was given alcoholic benzyl benzoate ggts. 20, t. i. d., for 3 days. He suffered intensely, crying from pain and sleeplessness. At the end of the third day he had a quite profuse hemorrhage and collapsed. His pulse was 160. The benzyl benzoate was discontinued. He was transferred to the Good Samaritan Hospital. Medium doses of Schlesinger's solution 4 to 6 times per diem were given. Passive congestion was applied twice a day for 4 weeks, later once a day. Wet dressing was applied.

The demarcation line became very pronounced. Very rapid progress was made with the fingers, but intense pain persisted, exaggerated to a marked degree by the application of passive congestion.

During the second week in the hospital Dr. Laurence Selling saw the patient in consultation. We agreed to tell the family that the case was practically hopeless and that all we could do was to keep him comfortable by relieving his pain with morphia.

During the second week in the hospital I decided to administer anterior pituitary substance in the hope of supplying the mysterious trophic stimulus so overabundantly furnished to the acral structures in cases of acromegaly. He was given 2 gr. t. i. d. The result was almost dramatic in effect. In but a few days the pain decreased to such an extent that the patient remained without morphia for days at a time. Occasional application of passive congestion, however, intensi-

fied the pain so that small doses of morphia were necessary, but during the fourth week morphia was abandoned entirely and after that recourse to it was not necessary.

The patient gained in appetite and craved bread particularly; ¼ gr. of thyroid was added during the fourth week.

All the fingers revived. The right thumb proved to be necrotic only as far as the soft parts were concerned and healed completely during the fifth week in the hospital. Necrosis of the third left finger involved the bone.

The patient left the hospital after 2 months. He gained over 20 pounds in weight (weighing then 174 pounds). He did not suffer the slightest pain, his blood pressure averaged 130-135 systolic, and 60-70 diastolic. His pulse was 72-76.

He slept a little too much, averaging some eleven hours, and was in splendid physical condition with the exception of his third left finger, which was still in the process of repair.

In January, 1922, the patient was presented to the Portland City and County Medical Society. His condition, with the exception of the third left finger, was perfect.

In March, 1922, the third left finger also healed, being shorter by about one-third of the terminal phalanx.

At the present time the patient is in perfect physical condition, has a constant weight, is working very actively and enjoying life generally.

Passive congestion had been discontinued with the healing of the fingers, but he is still on anterior pituitary and thyroid feeding. One could omit them and see what happens next, but the patient is as yet unwilling to try the experiment, the horrors of his intense suffering being too fresh and vivid in his memory.

Abstract Department

The effect of ADRENALECTOMY upon the total metabolism of the cat. Aub (J. C.), Forman (J.) & Bright (E. M.), Am. J. Physiol. (Balt.), 1922, **61**, 326-348.

This paper deals with the basal metabolic changes which follow the extirpation of the adrenals. The work was undertaken with the object of studying more thoroughly the possible independent relationship of the adrenals to the control of the metabolic rate. The method of Benedict and Homans was used. A large volume of data is presented in the form of charts. Forty-eight hours after the removal of both adrenals in the cat there is a reduction of about 25% in the total metabolism without marked change in the relative percentages of foodstuffs burned. The removal of one adrenal causes a temporary fall, followed by a return to normal. Denervation of the remaining adrenal is followed by a slow fall in the metabolic rate. Evidence for the independence of the thyroid and adrenal effects upon the metabolic rate is discussed and the theory is suggested that the thyroid is the slowly acting regulator of the metabolic mechanism, while the adrenals control quick changes of short duration by variations in their secretion.—T. C. B.

ADRENAL bases, hyperglycemia and glycosuria (Bases adrénalinques, hyperglycémie et glycosurie). Bierry (H.), Rathery (F.) & Levina (Mlle. L.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1133-1135.

It was noticed that no glycosuria developed after the injection of certain salts of adrenalin and this led to a study of a number of adrenalin bases, both natural and synthetic. After the injection of certain adrenalines there may be notable hyperglycemia without the appearance of glycosuria. On the contrary, other adrenalines easily provoke glycosuria, but not so marked as that described after the injection of the natural (levo) adrenalin of Bertrand.—T. C. B.

Variations of protein sugar after injection of ADRENIN (Variations du sucre protéidique après injection d'adrénaline). Bierry (H.), Rathery (F.) & Levina (Mlle. L.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1135-1137.

In studying the effect of adrenalin on glycemia the authors have limited their observations to the free sugar. This paper deals with the protein sugar. Injections of various adrenalines were made into

dogs, and a comparative examination of the concomitant variations in free sugar and protein sugar, using the method of Bertrand, were made. On the whole, the variations of the two kinds of sugar are in the inverse sense; the diminution of the protein sugar at the beginning of the action of adrenalin coincides with the maximum of free sugar in the plasma. Tables of results are given.—T. C. B.

The metabolic effect of ADRENALECTOMY upon the urethanized cat. Aub (J. C.), Bright (E. M.), & Forman (J.), Am. J. Physiol. (Balt.), 1922, **61**, 349-368.

There is considerable evidence that adrenin is secreted more rapidly under urethane than in the animal with no anesthesia. Therefore, a series of experiments were made on urethanized cats, as it seemed possible that the effects of adrenalectomy on metabolism might be more readily observed. Many tables are given, and the evidence suggests a greater flow of adrenalin under urethane anesthesia than normal. After removal of the adrenals under urethane there is a prompt fall of metabolism averaging 12 per cent; this drop also occurs after removal of the **thyroid**, showing that this latter gland is not essential to the reaction. Intravenous injection of adrenalin at a physiological rate causes a rise in metabolism. It is suggested that the fall in metabolism is due to an absence of the adrenal secretion.—T. C. B.

(ADRENAL) Oedema in food-deficiency diseases. Bigland (A. D.), Lancet (Lond.), 1920, **i**, 243-247.

The paper deals with many outbreaks of epidemic dropsy during the late war, associated with various pathological and especially dietary conditions. Malnutrition (lack of vitamines, etc.) leads to hypertrophy of adrenals (McCarrison) and thus to oedema. Hyperactivity may in time lead to adrenal insufficiency, just as exophthalmic **goiter** gives place to **myxedema.** Pellagra is considered to be an example of this.—Physiol. Abst., **5**, 31.

Action of ADRENIN on the respiratory exchange and nitrogen of 24 hours. Importance of the method of administration (Action de l'adrénaline sur les echanges respiratoire et azotes des 24 heures. Importance de la voie d'administration). Bru (P.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1068-1069.

Adrenalin, administered subcutaneously, increases oxygen consumption by as much as 31 per cent, while if given by mouth it causes a slight decrease. The excretion of nitrogen is not modified. —T. C. B.

The production of ADRENAL discharge by piqûre. Carrasco-Formiguera (R.), Am. J. Physiol. (Balt.), 1922, **61**, 254-271.

The experiments were done on cats and the denervated heart was the index to increased adrenal secretion. Puncture of the floor

of the fourth ventricle increased the rate of the denervated heart even when the hepatic factor was eliminated by section of the hepatic nerves. Increased heart rate did not occur if the venous path from the adrenals was blocked. It was concluded that "piqûre" produced discharge from the adrenals of a product that reached the arterial blood in sufficient amount to exert on other organs an effect identical with that of adrenalin.—T. C. B.

SUPRARENAL gland in anesthesia. Corbett (J. F.), J. Am. M. Ass. (Chicago), 1922, **79**, 543-545.

Corbett seeks a condition common to those patients who react badly under ether anesthesia, as noticed particularly in typhoid fever, all severe infections, starvation, late intestinal obstruction, shock, secondary anemia due to hemorrhage, **exophthalmic goiter,** and in prolonged etherization itself. The common condition, according to his research, is epinephrin exhaustion. Epinephrin is necessary to maintain vasoconstriction, which in turn is essential to the maintenance of proper blood pressure and circulation where the blood volume is small. When the epinephrin output is exhausted the vascular system decompensates and death ensues. The study entailed the determination of the residual epinephrin in the suprarenal gland in animals subjected to various procedures or dying from various causes. The determinations were made according to the physiologic standardization method of Elliot. Three hundred and fifty such experiments were done, the results being tabulated. In all cases the epinephrin content was less than one per cent of the normal. He does not believe that epinephrin exhaustion is shock, but that the exhaustion is the cause of final collapse.—W. M. A.

An anomalous arterial supply to SUPRARENAL, kidney and OVARY. Dawson (A. B.) & Reis (J. H.), Anat. Record (Phila.), 1922, **23**, 161-167.

Certain anomalies of the arterial system in a full term female fetus are described. They are interpreted as supporting Bremer's claim that the renal, suprarenal, and sex-gland arteries are derived from an early periaortic plexus. The article is not of immediate endocrine interest.—W. J. A.

(ADRENALS) Restriction hyperglycemia and glucosuria in rabbits. Fujii (I.), Tohoku J. Exper. Med. (Sendai), 1922, **2**, 531-561.

The seasonal variations of restrictional hyperglycemia in rabbits are not influenced by the external temperature nor the degree of coolness of the room temperature. The degree of the glucosuria is influenced on the one hand by the external temperature and on the other it is dependent upon the degree of hyperglycemia. The glycogen content of the liver of rabbits in the winter and spring is reduced by a one day fast to a third of the normal; a two day fast reduces it to a quarter of its normal value.—F. S. H.

(ADRENAL) Addison's disease with vasomotor phenomena, particularly of the fingers (Maladie d'Addison avec phénomènes vasomoteurs particuliers des doigts). Hanns, Soc. Méd. du Bas-Rhin, 1922, July 24; abst., Presse méd. (Par.), 1922, **30**, 694.

The author reports a case of Addison's disease with little pigmentation, relatively moderate asthenia and very great hypotension. When the abdomen was palpated a tumor was found which autopsy showed to be the adrenal capsule, increased in volume by tuberculosis infiltration. Besides, there was a series of accessory symptoms: contraction of the muscles of the thigh, central and peripheral hypothermia except in the abdomen, uneven pupillary movement of sympathetic origin, ocular hypotonia, extreme dilatation of the pupil after the instillation of cocaine, diminution of urinary acetone, decrease of glycemia and marked vasomotor troubles consisting in paleness of the fingers following immersion of the hand in cold water. Oscillations of the radial and of the humeral arteries underwent about the same modifications. The significance of these phenomena is the same as that of the line of Sergent and is explained by vasomotor hyperexcitability due to defective functioning of the sympathetic.—R. G. H.

The emergency functions of the ADRENAL. Hartman (F. A.), Science (N. Y.), 1922, n. s. **56**, 146-147.

The iris on one side was sensitized to epinephrine by removal of the superior cervical ganglion. The ciliary ganglion was removed in order to eliminate central nervous influence. It was found that stimulation of the moist pinna by rapidly repeated induction shocks caused a dilatation of the denervated pupil. Asphyxia caused almost maximal dilatation. Exposure to cold caused a marked dilatation. After removal of both adrenals, induction shocks, asphyxia and cold caused little or no effect on the denervated pupil.—F. A. H.

(ADRENAL) SUPRARENAL support in phenol poisoning. Hayes (C. F.) & Horn (W. S.), Texas State J. M. (Ft. Worth), 1922, **18**, 218.

A case in which a patient, comatose and apparently moribund two hours after swallowing one ounce of carbolic acid, was given 20 minims of adrenalin hypodermatically. This was repeated every two hours for eighteen hours. Recovery was complete.—C. R.

Influence of the ADRENAL cortex upon the health and growth of various organisms (Der Einfluss der Nebennierenrinde auf Gesundheit und Wachstum verschiedener Organismen). van Herwerden (M. A.), Biol. Zentralbl., 1922, **42**, 109-112.

One to two milligrams of dried adrenal cortex tissue when added to 10-15 cc. of hay infusion containing Daphnia pulex stimulated growth and accelerated the maturing and reproductive proc-

esses. Similar stimulation of growth was observed with the eggs of the snail (Limnaea ovata) and with frog larvae (Rana esculenta). In the case of tadpoles, larger and stronger larvae were produced than in those fed **hypophysis** extract. Neither hypophysis nor adrenal extracts had any effect upon the metamorphosis of the tadpoles. The general favorable influence of small quantities of adrenal cortex upon the nutrition of animals is emphasized.—Chem. Abst., **16**, 2937.

The functions of dogs deprived of the ADRENAL medulla (Les fonctions des chiens privés de la substance medullaire surrénale). Houssay (B. A.) & Lewis (J. T.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 565-567.

Of 9 dogs from which the suprarenal medulla on the left side was destroyed, and the right entire gland removed, 5 survived, and appeared normal. There was no asthenia; the pulse, respiration and temperature were normal. The wound cicatrized perfectly. One month after the second operation the injection of adrenalin or of extract of **hypophysis** caused a rise of pressure similar to that of the controls. Mydriasis of the same intensity and duration as in the controls was obtained by instillation of cocaine, atrophine and adrenalin. The composition of the blood was normal. There were no pigment changes. No changes were found on autopsy, except a cicatrix occupying the place of the entire medulla of the left suprarenal. There was no trace of suprarenal on the right side, and no accessory glands. It seems that complete destruction of the suprarenal medulla is compatible with a normal state, while the cortex is of importance quo ad vitam.—T. C. B.

(ADRENAL) Addison's disease, with severe anemia, treated by suprarenal grafting. Hurst (A. F.), Tanner (W. E.) & Osman (A. A.), Proc. Roy. Sec. Med. (Lond.), 1922, **15**, 19-20.

Details of a partially successful case.—A. T. C.

The antagonism between histamine and ADRENALIN. Kellaway (C. H.) & Cowell (S. J.), J. Physiol. (Lond.), 1922, **56**, xx-xxi.

The intravenous injection of small doses of histamine causes slowing of the heart, dilatation of the pupil, sweating and salivation, but in addition there is a rise in the hemoglobin percentage of the venous blood, which, in normal cats passes off in 20 to 30 minutes. In cats dying of adrenal insufficiency there is a similar, or greater concentration and the effect persists for several hours. In the animals upon which these observations were made one pupil had been denervated by excision of the superior cervical ganglion, and responded preferentially. During this response small doses of histamine caused either little or no concentration of hemoglobin. Animals with marked adrenal insufficiency are often prostrated by a minute dose of histamine, but this does not occur if adrenalin is first

administered. The authors hope later to differentiate the part played by medulla and cortex in these phenomena.—T. C. B.

(ADRENALS) Addison's disease; report of case. Koo (U. K.), Nat. M. J. China (Shanghai), 1922, **8**, 120.

Reference cited from J. Am. M. Ass., **79**, 999.

ADRENAL therapy. Lawrence (C. H.), Boston M. & S. J., 1922, **187**, 168-169.

This paper gives a very brief summary of the conditions in which extracts of the adrenal may be useful. It closes with a warning against indiscriminate adrenal therapy. There is no new information.—J. C. D.

ADRENAL disturbances in infantile pathology, particularly acute adrenal insufficiency (Les troubles des surrénales en pathologie infantile et spécialement l'insuffisance surrénale aigue). Lereboullet (M.), Progrès méd. (Par.), 1922, **37**, 199-202.

One of a series of lectures. Generalized discussion.—F. S. H.

Chronic ADRENAL insufficiency and Addison's disease in childhood (L'insuffisance surrénale chronique et la maladie d'Addison chez l'enfant). Lereboullet (M.), Progrès méd. (Par.), 1922, **37**, 210-212.

One of a course of lectures. No new data.—F. S. H.

Studies of the function of the ADRENALS by means of the functional survival method, together with the production of a cardinal symptom of Addison's disease (Beiträge zur physiologie der Drüsen. Mitt. 50 Asher, L. Untersuchungen über die Funktion der Nebennieren mit Hilfe der funktionellen Ueberlastungsmethode, und über die Erzeugung eines Kardinalsymptomes des Morbus Adisonii). Mauerhofer (E.), Ztschr. f. Biol. (München u. Leipz.), 1922, **74**, 147-172.

The adrenals can be removed from the rat and the animal will survive. This, however, fails to give data concerning the function of the adrenals in this animal. Nevertheless, if adrenalectomized rats are made to do work it is found that they become tired and exhausted much more quickly than do normal animals. The recovery from fatigue is also much slower and much less complete. Hence, it was possible to reproduce a cardinal symptom of Addison's disease. The possible replacement value of accessory adrenal tissue is discounted in these experiments, inasmuch as the adrenalectomized rats exhibited extreme fatigue after exercise even though the so-called accessory tissue was present. Hence this latter can be but of minor importance. Attempts to carry on similar studies on guinea-pigs were generally unsuccessful, because the animals died after adrenalectomy.—F. S. H.

The action of the ADRENAL lipoids in epilepsy (Sur l'action des lipoïdes surrénaux dans l'epilepsie). Parhon (C. J.), Bull. et. mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 58-63.

The intravenous injections of adrenal lipoids is reported to have caused the seizures of epilepsy to be less frequent and less severe during the administration of the preparation.—F. S. H.

Changes in the ADRENAL capsule in insane pellagrins (Sur les alterations des capsules surrénales chez les aliénés pellagreux). Parhon (C. J.) & Savini (E.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 6-11.

The adrenals in pellagra are frequently found sclerosed. Nevertheless the lesion is far from constant in appearance.—F. S. H.

Three cases of adenoma of the ADRENAL cortex (Trois cas d'adenômes cortico-surrénaux). Parhon (C. J.) & Stocker (A.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 12-17

Two of the cases reported were associated with the syndrome of hirsutism.—F. S. H.

The treatment of alopecia with ADRENAL lipoids (Sur le traitement opothérapique surtout par les lipoids surrénaux dans un cas de pélade du cuir chevelu et des sourcils). Parhon (C. J.) & Jacoby (D.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 77-84.

The case is described of a young lady of 20 years giving a history of scarlet fever, fright and malaria. There was marked alopecia. The thyroid was sightly enlarged. A preliminary attempt to induce hair growth by thyroid medication was unsuccessful. The injection of 0.03 grams of adrenal lipoids every other day and the ingestion of 0.25 grams of desiccated thyroid gland was followed by a good growth of hair.—F. S. H.

Studies in experimental traumatic shock. IV. The liberation of EPINEPHRIN in traumatic shock. Rapport (D.), Am. J. Physiol (Balt.), 1922, **60**, 461-475.

Conflicting results and opinions as to the relation of the adrenals to traumatic shock led to the experiments here reported. Cats were used and shock induced by crushing the hind limb, the denervated heart being used as an indicator of adrenal activity. Full data are given in the form of tables, and a discussion of the results. In six out of nine cases there was evidence of hyperactivity of the adrenal glands during the development of traumatic shock. There was not sufficient reason to believe that either oversecretion of the adrenals, or their exhaustion, was a factor in the production of shock. It is probable that over-activity of the glands, in the development of shock, is a concerning factor.—T. C. B.

An undescribed relation of the SUPRARENALS to OVULATION. Riddle (O.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 280-282.

The observations described here were made on pigeons, and make it extremely probable that the adrenals regularly and greatly enlarge in close relation to the time of liberation of ova from the ovary. The maximum size seems to be attained in the 44-hour interval between the ovulation of the first and second ova. The early stages of adrenal enlargement are coincident with the 4 to 5 days of extremely rapid growth which the ova undergo just before their expulsion from the ovary. Before undertaking the present study it had been found that birds which died of tuberculosis or from the presence of round worms usually showed enlarged adrenals.

—F. S. H.

(ADRENALS) Subsequent course of a case of Addison's disease. Rowntree (L. G.), J. Am. M. Ass. (Chicago), 1922, **79**, 556-557.

The late Dr. A. L. Muirhead described his own, a typical case, under the heading "An autographic history of a case of Addison's disease" (J. Am. M. Ass., 1921, **76**, 652). The disease developed after a unilateral nephrectomy. Rowntree reports the subsequent course of events. Epinephrin and whole suprarenal gland therapy proved very efficacious temporarily, resulting in even temporary clearing up of the pigmentation. Intrarectal administration proved efficacious but was discontinued on account of tenesmus. The results justify a thorough trial of similar treatment in other cases of Addison's disease.—W. M. A.

(ADRENALS) The white line of Sergent (La ligne blanche cutanée, dite surrénale). Sézary (A.), Ann. de méd. (Par.), 1922, **11**, 403-415.

The result of the studies of Sézary lead him to conclude that there is but one white line of the skin, and that is the physiological one described by Macey in 1858. It is observed in both well and diseased persons. Whether isolated or associated with asthenia or arterial hypotension, this white line has no relation to adrenal insufficiency.—F. S. H.

Ablation of an ADRENAL for hyperfunction (Exstirpation bei Hyperfunktion einer Nebenniere). Stephan & Flörcken, Wien. klin. Wchnschr., 1922, **35**, 664; Deutsche med. Wchnschr. (Berl.), 1922, **48**, 929.

In two cases of hypertension ablation of an adrenal produced only a fall of the number of erythrocytes. After the operation the patients showed an increased disposition to pigmentation of the skin. In one case in which the adrenals were exposed to x-rays, postmortem examination showed a reduction of the cortex. The chromaffin system was not altered.—J. K.

Morphine hyperglycemia and the ADRENALS. Stewart (G. N.) & Rogoff (J. M.), Am. J. Physiol. (Balt.), 1922, **62**, 93-112.

Hyperglycemia is less commonly induced by morphine in cats which have recovered from "complete" operations on the adrenals than in normal cats, or cats which have recovered from such operations as splenectomy. When hyperglycemia occurs in cats after adrenal operations it is less marked and more slowly reached. Dogs and cats behave in the same way. It is thought that morphine hyperglycemia is not an "adrenalin-hyperglycemia" due to stimulation of the glands, but that the ordinary output facilitates its production.—T. C. B.

ADRENAL-PANCREAS relations. I. Adenoma of the adrenal cortex and the islands of Langerhans (Relations surréno-pancréatiques. I. L'adénôme cortico-surrénal et let îlots de Langerhans). Stocker (A.), Bull. et mém. Soc. neurol., psychiat., et psychol. de Jassy, 1920, **2**, 45-48.

A preliminary paper in which an attempt is made to establish an associative proliferation of the islands of Langerhans with adenoma of the adrenal cortex.—F. S. H.

The ADRENAL in experimental DIABETES (La surrénale dans le diabète expérimentale). Stocker (A.), Bull. et mém. Soc. neurol. psychiat. et psychol. de Jassy, 1921, **2**, 100-103.

Report of the histological examination of the adrenals of 6 dogs which had been rendered diabetic by **pancreatectomy.** There was found a constant occurrence of an excess of lipoid granules in the cortical zone.—F. S. H.

ADRENAL-PANCREAS relations. II. The experimental results (Relations surréno-pancréatiques. II. Les donnés expérimentales). Stocker (A.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 84-88.

Dogs were injected daily with gradually increasing doses of adrenin until 1 cc. was being given. This dosage was maintained until the experiment was terminated at 40, 50 and 60 days thereafter. The pancreas was removed and examined histologically. There were no noticeable modifications of the isles of Langerhans The adrenal cortex was surcharged with an excess of lipoids.

—F. S. H.

The adrenalinemia following excitation of the splanchnic testifies to a secretory activity of the ADRENALS, governed by the nervous system L'adrénalinémie consécutive à l'excitation des surrénales, régie par le systéme nerveux). Tournade (A.) & Chabrol (M.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 776-778.

The process of physiological ADRENALEMIA: For and against (Le procès de l'adrénalinémie physiologique: le pour and le contre). Tournade (A.) & Chabrol (M.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 778-780.

Remarks regarding the communication of Tournade and Chabrol (Remarques à propos de la communication de MM. Tournade et Chabrol). Hallion (L.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 780.

These articles are an answer to their critics and are controversial in nature.—T. C. B.

Influence of total decapsulation, then transfusion of ADRENAL venous blood, upon the arterial pressure; reality of a secretion of ADRENALIN without artificial excitation of the splanchic nerve (Influence de la décapsulation totale, puis de la transfusion de sang veineux surrénal, sur la pression artérielle; réalité d'une sécrétion d'adrénaline en dehors de toute excitation artificielle du nerf splanchnique). Tournade (A.) & Chabrol (M.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 840-841.

In order to prove that adrenalin maintains arterial pressure, both suprarenals were removed from dog A. The blood pressure fell from 150 mm. Hg. to 80 mm. Meanwhile an anastomosis was made between the jugular of dog A and the right suprarenal vein of another dog, B, and the left suprarenal gland of dog B removed. On allowing the suprarenal blood of B to circulate in A, the pressure of A rose to 160 mm. Hg. The right splanchnic of B was then cut and the pressure of dog A fell to 100 mm. Hg. On stimulating the peripheral end of the same nerve, this pressure again rose to 160 mm. It is concluded that the suprarenal secretion plays an undeniable rôle in maintaining blood pressure and that the secretion is continuous through the tonic activity of the splanchnic.—T. C. B.

Revival of a decapsulated dog by transfusion of the venous blood of the ADRENALS (Reviviscence d'un chien décapsulé par transfusion de sang veineux surrénal). Tournade (A.) & Chabrol (M.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 842-843.

The experiment reported seems to demonstrate the reality of the internal secretion of the suprarenals and its powerful cardio- and angio-tonic action. After bilateral removal of the suprarenals in dog A, the blood pressure fell to 70 mm. Hg. in about 3 hours. While preparing a venous anastomosis of the jugular of dog A, with the right suprarenal vein of dog B, dog A apparently died. The blood pressure fell to zero, the heart and respiration stopped. No time was lost in transfusing from dog B, and in 30 to 40 seconds the heart began to beat and the blood pressure registered 45 mm. Artificial respiration for 5 minutes established a spontaneous respira-

tion which continued. The right splanchnic was cut and its peripheral end stimulated, and the blood pressure rose in dog B by pure vaso-constriction, more slowly in dog A by adrenalin secretion. When the nerve of dog B was not stimulated the pressure in dog A fell to 2 or 3 mm. and the dog "died" a second time. Excitation of the splanchnic again brought the pressure up to 48 mm. These facts testify to the existence of a physiological adrenalinemia.

—T. C. B.

Anastomosis of the ADRENAL with the jugular vein. Response to an objection of M. Hallion (À propos de l'expérience d'anastomose veineuse surrénalo-jugulaire. Reponse à une objection de M. Hallion). Tournade (A.) & Chabrol (M.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1137-1139.

A reply to his critics. Contains no new observations.—T. C. B.

Sudden death in infancy in consequence of acute ADRENAL insufficiency (Über plötzliche Todesfälle im Sauglingsalter als Folge von akuter Nebenniereninsuffizienz). Victor (M.), Ztschr. f. Kinderh. (Berl.), 1921, **30**, 44-54.

A report of two cases. A 14 months old boy was taken acutely ill with abdominal pain, irregular respiration, convulsions and rapid collapse. Death occurred 20 hours after the onset of symptoms. Necropsy showed hypoplasia of the left suprarenal with atrophy and calcification of the right. A 7 months old boy died during the night following the development of an extensive purpuric eruption. Necropsy showed hemorrhages into the skin and adrenals. In both cases Victor considers death as due to an acute adrenal insufficiency. In the second case this was due to hemorrhage. In the first case the insufficiency was due to atrophy following a probable hemorrhage into the gland at birth. The author does not consider ante-mortem diagnosis possible and doubts the possibility of effective therapy.

—C. H. G.

Effect of SUPRARENALECTOMY on nerves. Wertheimer (E.) & Duvillier, Echo méd. du nord (Lille), 1922, **26**, 229.

The excision of suprarenals in dogs and cats by Wertheimer and Duvillier demonstrated that the splanchnic nerve fibers inhibiting intestinal contraction possess an excitability independent from the one conferred by epinephrin in the blood.—J. Am. M. Ass., **79**, 921.

Active and potential ADRENALIN (Adrénaline active et adrénaline virtuelle). Abelous (J. E.) & Soula (L. C.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 749-750.

Adrenalin cannot be detected in the vena cava a short distance below the opening of the suprarenal veins. What becomes of it? The authors think it is not destroyed but only inactivated. It is

the amino group in adrenalin that is responsible for the rise of blood pressure and pupil dilatation, and there is some substance in the blood that inactivates this group, but does not destroy it. If ½ mgr. of adrenalin is added to 10 cc. horse serum (hémostyl) and the enucleated eye of a toad put immediately into this mixture, dilatation of the pupil takes place in a few minutes. If, however, the mixture is allowed to stand for 45 minutes before the eye is put in, the mydriatic effect is completely suppressed. Such a mixture, if injected intravenously into a dog, immediately causes a strong rise of pressure; but if allowed to stand for an hour, double or triple the quantity will cause no rise. That the adrenalin is not destroyed is shown by the fact that when a fragment of muscle or pulpified intestine is added to inactive serum-adrenalin mixture, the pupil dilates as markedly as the control. The action on blood pressure is not so marked on account of the presence of a hypotensive substance in the extracts. This phase is being studied further. It is concluded that contact with blood serum causes adrenalin to lose its hypertension and mydriatic properties but that they reappear upon contact with tissues, particularly those rich in nerve terminations.—T. C. B.

Researches on ADRENALIN DIABETES. Achard (C.), Ribot (A.) & Binet (L.), Lancet (Lond.), 1921, **ii**, 139-140.

This is a brief but interesting report of experiments on the effects of adrenalin on carbohydrate metabolism. Series of experiments were performed on the influence of adrenalin on the glycolytic power of the organism, indicated by provoked hyperglycemia, on the relations between adrenalin and pancreatic extract, and on the effect of adrenalin on the depancreatized animal. Dogs were used as the experimental animals. For the first series of experiments, hyperglycemia was first provoked by intravenous injection of from 3.5 gms. to 7.0 gms. glucose, and the blood glucose curve determined. With such curve as a control a similar amount of glucose was given in like manner on a subsequent date but with addition of 1 mg. of adrenalin. Adrenalin was also injected alone. It was found that more marked and more prolonged hyperglycemia was produced by adrenalin than by the small dose of sugar given and that it was greater when the two were injected together than the sum of both increases. It was concluded that the organism under the influence of adrenaline is unable to fix and burn sugar. Fresh pancreatic extract reduced hyperglycemia when injected, and when added to adrenalin inhibited the effects of the latter. In the third series of experiments the mechanism of adrenalin hyperglycemia was studied by repetition of the above experiments, but on depancreatized dogs. It was found that no hyperglycemia followed the injection of adrenalin in these animals. The conclusion is drawn, therefore, that the adrenalin exerts its action on carbohydrate metabolism only by inhibiting the glycolytic function of the pancreas.—I. M.

The action of atropine upon the effects of ADRENALIN on the uterus (L'action de l'atropine sur les effets provoqués par l'adrenaline sur l'uterus). The importance of atropine for the effects of ADRENALIN on the vessels and on the heart (Importance de l'atropine pour les effets de l'adrénaline sur les vaisseaux et sur le coeur). Action of atropine upon the effects provoked by ADRENALIN on blood pressure (Action de l'atropine sur les effets provoqués par l'adrénaline sur la pression du sang). Backman (E. L.) & Lundberg (H.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 475-483.

Employing the method of Magnus the action of atropine on various surviving organs has been examined. When adrenalin causes an augmentation of tonus and increased automatism, the addition of 10 mgm. of atropine sulphate to the bath will arrest the motor effects of the adrenalin. This action of atropine can be abolished by lavage, and the motor effects reappear. The uterus of the rabbit, guinea pig, cat, weasel and mouse was used. Atropine suppresses the action of adrenalin on isolated blood vessels. If we inject a cat with a large quantity of atropine, 2 cc. of adrenalin solution has no effect on the blood pressure, while the same quantity has a marked pressure effect before atropinisation. Atropine evidently paralyzes not only the parasympathetic, but also the motor part of the sympathetic. It does not act on the inhibitive side of the nervous system.—T. C. B.

(ADRENIN) The relation of blood supply and blood flow to sweating produced by pilocarpine. Burn (J. H.), J. Physiol. (Lond.), 1922, **56**, 232-247.

The sweating response to pilocarpine depressed after complete denervation can be temporarily restored by subcutaneous injections of adrenaline or by a period of ether anesthesia. Degeneration of the sympathetic nerve supply is not followed by diminished pilocarpine response. It is possible that adrenaline delays the disappearance of capillary tone consequent on degeneration of the sensory fibers.—T C. B.

(ADRENIN) Pseudo-paradoxical pupil-dilatation following lesions of the different paths. Byrne (J.), Am. J. Physiol. (Balt.), 1922, **61**, 93-105.

Of endocrine interest in that adrenalin was used in the experiments.—T. C. B.

(ADRENIN: PITUITRIN) Studies on the physiology of the capillaries. V. The reactions of the human skin capillaries to drugs and other stimuli. Carrier (E. B.), Am. J. Physiol. (Balt.), 1922, **61**, 528-547.

Of endocrine interest in that the constriction of the capillaries under influence of adrenalin and pituitrin has been directly observed in the human skin by Lombard's method.—T. C. B.

The vomiting of pregnancy with acidosis. The treatment with glucose and ADRENALIN. Therapeutic abortion. Cure (Vomissements incoercibles de la grossesse avec acidose. Echec du traitment hydrocarburé et de l'adrénaline. Avortement thérapeutique. Guérison). Cathala (V.) & Biancani (E.), Bull. d'obst. et gynéc. de Par., 1922, **11**, 219-223.

Adrenalin and glucose treatment proved ineffective.—F. S. H.

A further report on the classification of birth paralyses as ENDOCRINES. Clarke (L. B.), South. M. J. (Birmingham), 1922, **15**, 534-536.

Excluding cases of pure cretinism, unassociated, 30 cases of apparent birth paralysis have been under observation since February, 1919. One case report is given. The observations justify to the author the belief that many cases showing mental or physical deficiency or birth paralysis are due to disordered functions of the ductless glands.—F. S. H.

ADRENIN by intravenous injection. Cardio-vascular effect on the normal man (Épreuve de l'adrénaline en injection intraveineuse. Action cardio-vasculaire chez l'homme normal). Daniélopolu (D.) & Carniol (A.), Ann. de méd. (Par.), 1922, **12**, 127-149.

Amounts of adrenin ranging from 1:50,000 to 1:250,000 were injected into the subject in the reclining position and records made of the blood pressure. The tracings of the results are given. The conclusion is made that the drug is not a specific sympathetic stimulant, but induces reaction in the entire vegetative system. Because of the rapid destruction, intravenous administration is preferred to subcutaneous. The intravenous injection gives rise to 3 groups of phenomena: modification of cardiac rhythm; modification of arterial tension; and subjective disturbances. All occur when the strong dose of 1:100,000 is given. When weaker doses are administered, the cardio-vascular phenomena alone appear. There is first cardiac acceleration, then depression as the dose becomes smaller.—F. S. H.

Action of ADRENALIN on the human stomach, administered intravenously or by mouth (Action de l'adrénaline sur l'estomac de l'homme. Voie intraveineuse et voie gastrique). Daniélopolu (D.) & Carniol (A.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 716-718.

The movements of the stomach were recorded by the method of Carlson, modified. The intravenous injection of small doses of adrenalin (1:500,000) produces an exaggeration of the gastric contrac-

tions. Large doses (1:100,000; 1:50,000) clearly inhibit contractions, sometimes followed by exaggeration. Introduction into the stomach of 1 mgm. of adrenalin causes intense gastric contractions. From these results adrenalin is contraindicated in cases of hemorrhage from ulcers of the stomach.—T. C. B.

Studies of the expression in ENDOCRINOLOGY (Estudo da facies em endocrinologia). Dias (A.), Rev. dos Cursos de la Fac. de med. (Porto Alegre, Brazil), 1921, **7**, 214-235.

A discussion of the value of the study of the facial expression in the diagnosis of disorders of the endocrine system. The paper has many photographs depicting the facies characteristic of the more typical disturbances. With the exception of one case of **acromegaly**, all the illustrations have been taken from reports by other workers.

—F. S. H.

The influence of ADRENALIN on nephritis and its complications by injection into the kidney. Eaton (G. D.), Calif. State J. M. (San Fran.), 1921, **19**, 233-237.

Laboratory animals injected with 0.5 cc., 1:500 dilution of venom from a rattlesnake which had previously received injections of adrenalin caused death in a few hours. When 0.5 cc. of adrenalin was given along with the venom there was but little toxic effect. The same amount of venom from a snake which had not previously received injections of adrenalin caused death in ten minutes. The above experiments led the author to attempt the use of adrenalin in the treatment of the toxemia of nephritis. One patient, in shock because of severe hematuria of the right kidney, which was later shown to be tuberculous, received 1 cc. of adrenalin solution injected into the pelvis of the kidney. The blood pressure, which before the injection was 80/0, arose to 120/70. In other patients with nephritis and high blood pressure the administration of adrenalin into the pelvis of the kidney was followed within 24 hours by a fall of the pressure and an increase in the output of urine. Case reports are given illustrating the effects of pelvic injections of adrenalin on various degrees of nephritis.—H. W.

(ADRENIN) Blood sugar studies. Foster (G. L.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 408-412.

Results of the administration of various sugars to man and study of the blood sugar curves leads Foster to the belief that the **epinephrine** hyperglycemias are not to be reconciled with the hypotheses of Folin and Berglund (J. Biol. Chem., 1917, **30**, 79). The conclusion is drawn that the chief factor in preventing hyperglycemia is glycogen formation, since this is presumably the only carbohydrate function which is upset by epinephrine. The possibility of there being present a substance analagous to secretin is mentioned.

—F. S. H.

Action of ADRENIN on liver glycogen and on the weight and volume of the frog's liver (Action de l'adrénaline sur le glycogene hepatique et sur le poids et le volume du foie chez la grenouile). Gautier (C.), Compt, rend. Soc. de biol. (Par.), 1922, **87**, 157-159.

Adrenalin causes diminution or complete disappearance of glycogen from the liver of warm blooded animals. No experiments of a similar nature seem to have been made on cold blooded animals. This paper deals with the frog. Methods and protocols are given. From the results it is concluded that adrenalin injected several times diminishes the liver glycogen, but less intensely and less rapidly than in warm blooded animals.—T. C. B.

Circulation of ADRENIN in the frog after injection into the dorsal sac (Circulation de l'adrénalin chez la grenouille après injection dans les sacs dorsaux). Gautier (C.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 159-161.

If a frog is killed by section of the bulb, the eyes removed, and exposed to a strong light for half an hour, the pupils contract strongly. If the eye is then placed in water or saline solution, the pupil dilates. If the liquid contains adrenalin the dilatation is marked, and then a second exposure to bright light is not followed by myosis, or there is greater dilatation. If the doses of adrenalin is small, there may be slight constriction, but much less than the control in saline without adrenalin. If adrenalin is injected into the dorsal sack, strong dilatation occurs. If the animal is killed at the end of an hour, the enucleated eye exposed to artificial light does not respond by contraction of the pupil, but remains dilated. This resistance to the action of light may last 12 hours. Hence the tissues of the eye presumably remain impregnated with adrenalin. Blood from the abdominal vein of a frog injected with adrenalin 4 hours previously, causes mydriasis. After 20 minutes it is put in the blood from a second injected frog, and the dilatation becomes very marked. There is a cumulative action, permitting the absorption of more adrenalin. Three-quarters of an hour after injection of adrenalin into the leg, the enucleated eye is dilated. If the animal is killed and the eye exposed to light there is a partial contraction of the pupil, but the lumino-resistant mydriatic reaction is still present. This is considered evidence of the presence of adrenalin in the venous blood far from the zone of injection. As adrenalin cannot be discovered in the blood of mammals (Falta and Preistly), it must circulate in a combined state.—T. C. B.

The diverse effects of ADRENALIN upon the migration of the scale pigment and the retinal pigment in the fish, Fundulus heteroclitus, Linn. Gilson (A. S.), Proc. Nat. Acad. Sc. (Balt.), 1922, **8**, 130-133.

Report of experiments on fundulus which demonstrate that the injection of adrenalin will cause distal migration of the pigment processes in the retinas of animals that have been kept in the dark, but produces no significant change in the already extended processes of animals that have been exposed to the light. The changes in scale pigment is of a reverse nature.—T. C. B.

Studies in fatigue. XI. The effect of intravenous injection of massive doses of ADRENALIN upon skeletal muscle at rest and undergoing fatigue. Gruber (C. M.), Am. J. Physiol. (Balt.), 1922, **61**, 475-492.

In discussions upon the effect of adrenalin on skeletal muscle, its action on fatigued muscle has not been sufficiently considered, and this is one of the problems the author has set out to solve. The usual graphic methods were used on cats. Adrenalin injected intravenously has the same effect on non-fatigued and fatigued muscles. It lowers the threshold and increases the height of contraction as much as 240 per cent, if the dose is large. This increase depends on the concentration of adrenalin, the rate of stimulation and the condition of the animal. Slowly injected, the results are not so marked. The effects are only slightly, if at all, due to changes in pressure or bettered circulation. Adrenalin does not neutralize fatigue products, but increases the irritability of muscle, whether fatigued or not.—T. C. B.

Active and potential ADRENIN. In regard to the note by Abelous and Soula (Adrénale active et adrénaline virtuelle. Apropos de la note de MM. Abelous et Soula). Nicolas (E.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 849-850.

An objection to the work of Abelous and Soula on the ground that the horse serum used is a formalized serum, and a suggestion that the experiments be repeated with a serum free from such objections.—T. C. B.

ADRENALIN and liver glycogen (Adrénaline et glycogène du foie). Doyon (M.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 598.

Richter, in an article on the relation which exists between fever and the elimination of sugar, alluded in a few words to the action of adrenalin on the liver glycogen. Doyon was the first to demonstrate that adrenalin causes glycogen to disappear from the liver of the dog and rabbit. His results were extended to the frog by Gautier.

—T. C. B.

Action of ADRENALIN on the striated muscular system (Action de l'adrénaline sur le système musculaire strié). Guglielmette (J.), Compt. rend, Soc. de biol. (Par.), 1922, **87**, 692-694.

Resumé of experiments which lead to the conclusion that adrenalin modifies the contraction, excitability and latent period of fatigued muscles by acting on the neuro-muscular junction.—T. C. B.

The liberation of EPINEPHRIN during muscular exercise. Hartman (F. A.), Waite (R. H.) & McCordock (H. A.), Am. J. Physiol. (Balt.), 1922, **62**, 225-241.

A continuation of experiments previously described, in which proof is given that dilatation of the denervated pupil during exercise is due to epinephrin. The maximum output reached depends upon the intensity and duration of the exercise. There is an after secretion which lasts for a varying length of time, according to the vigor and duration of the exercise.—T. C. B.

(ADRENIN) The reaction to EPINEPHRIN administered by rectum. Hoskins (R. G.), J. Pharmacol. & Exper. Therap. (Balt.), 1921, **18**, 207-211.

Dogs and cats were used. Blood pressure and peristalsis were recorded. Doses of 1 to 5 mgm. of epinephrin produced either no or relatively slight effects.—J. B. C.

The rôle of ADRENALIN in the hypertensive effects produced by excitation of the splanchnics or by bulbar puncture (Rôle de l'adrénalin dans les effets hypertensifs produit par excitation du nerf splanchnique ou par piqûre bulbaire). Houssay (B. A.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 695-698.

Confirmation of the results of Tournade and Chabrol that stimulation of the splanchnics causes a direct vaso-constriction and also a constriction due to adrenalin liberated from the adrenals.—T. C. B.

Comparative studies on respiration. XXIII. The effect of ADRENALIN on the production of carbon dioxide by animals and by plants. Hutchinson (D. M.), Am. J. Physiol. (Balt.), 1922, **62**, 192-196.

The effect of adrenalin on the production of CO_2 by radish seedlings and by frog's muscle is similar. Stronger solutions (0.002-0.003 per cent) cause a depression, followed by a return to normal; weaker solutions produce a rhythmic effect; the CO_2 falls, rises, falls and rises again.—T. C. B.

Some modifications of the colorimetric method for the determination of ADRENALIN by Folin, Cannon and Denis. Kodama (S.), J. Biochem. (Tokyo), 1922, **1**, 281-287.

A new standard color solution is used, made as follows: Grübler's Water blue (0.1g. per liter) 4 cc.; Grübler's Nigrosin (0.1g. per liter) 4 cc.; $CuSo_4$. $5H_2O$ (10%) 10 cc.; HCl (sp. gr. 1.05) 10 cc., and H_2O to 100 cc. The above mixture when set at 20.6 in a

Dubosq colorimeter corresponds to the color developed with 0.1 mg. of adrenalin set at 20.0 mm. The uric acid reagent of Benedict and Hitchock (J. Biol. Chem., 1915, **20**, 619) and 20% Na_2CO_3 are used for the development of the color in the test solution.—F. S. H.

The influence of ADRENALIN on the permeability of the muscle bundle membrane (Die Einwirkung des Adrenalins auf die Permeabilität von Muskelfasengrenzschichten). Lange (H.), Ztschr. f. physiol. Chem. (Strassb.), 1922, **120**, 249-236.

Adrenalin has the ability to increase the permeability of the limiting membrane of striated muscle of the frog.—F. S. H.

The secretion of sweat. Part II. The effect of vaso-constriction and of ADRENALIN. Langley (J. N.) & Uyeno (K.), J. Physiol. (Lond.), 1922, **56**, 206-226.

A continuation of the work previously reported (see Endocrin., 1922, **6**, 529). The secretory effect of adrenaline was generally less than that of Ringer's solution, whether it was used in 0.001 per cent or 0.1 per cent solution. The secretion is limited to the area injected. These facts lead to the conclusion that it is the fluid and not the adrenaline that causes the secretion, and it is less because of the decreased blood supply to the glands, which in turn causes a lowering of skin temperature. **Pituitrin** produces insufficient vaso-constriction to interfere with secretory activity.—T. C. B.

(ADRENIN) Remarks relative to the communication of M. Dorlencourt. Netter (A.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1131.

Opinions differ as to the absorption of adrenalin by the digestive tract. Ingestion has no effect on blood pressure; on the other hand, clinicians obtain beneficial results. The authors have shown that chlorolose has a stabilizing effect on the amount of blood sugar, and have used this method to solve the problem. A dog was anesthetized with chlorolose and the normal glycemia determined at 15 minute intervals. Then 8 cc. of a solution of adrenalin, 1:1000, in 40 cc. of water was introduced by stomach tube and blood sugar determinations made every 10 minutes. The hyperglycemia which followed was very marked and progressive, reaching a maximum in about 50 minutes. There can be no doubt, then, that adrenalin is absorbed by the digestive tract [see Absorption of adrenin by the digestive tract (Absorption de l'adrénaline par voie digestive). Dorlencourt (H.), Trias (A.) & Paychère), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1129-1131].—T. C. B.

Treatment of rachitis with ADRENIN (Behandlung der Rachitis mit adrenalin). Lenert & Weinberg, München med. Wchnschr., 1921, **68**, 1482-1484.

Adrenin hydrochloride 1:1000 was administered 3 to 4 times daily in doses of 0.2, increasing to 0.5. In addition calcium carbonate was given three times daily in small amounts (what would be contained on a knife-tip) for 4 to 6 weeks. This treatment is indicated in all severe cases of rachitis where the usual anti-rachitic treatment is unavailing.—F. S. H.

EPINEPHRIN hypersensitiveness and its relation to hyperthyroidism. Peabody (F. W.) & Sturgis (C. C.), Tr. Ass. Am. Physicians (Phila.), 1920, **35**, 110-121.

See Endocrinology, 1922, **6**, 128.

ADRENALIN in the Stokes-Adams syndrome. Phear (A. G.) & Parkinson (J.), Lancet (Lond.), 1922, **1**, 933-936.

This paper gives a detailed description of a case of heart block in a woman of 49 years with frequent fainting spells. Prompt relief from the attacks and increase in ventricular rate followed the subcutaneous injection of 5 minims of 1:1000 adrenalin. After the repetition of the injection, but with a 10 minim dose, the patient remained free from attacks throughout the remainder of her stay in the hospital (4 weeks). The authors did not feel certain as to the complete disappearance of the block, although they assumed that the mechanism had probably returned to normal. Literature on the subject is briefly discussed.—I. M.

ADRENALIN hyperglycemia and hyperglycorachia (Hyperglycémie et hyperglycorachie adrénaliques). Polonovski (M.), Duhot (E.) & Morel, Compt. rend. Soc. de biol. (Par.), 1922, **87**, 679-680.

Experimental adrenalin hyperglycemia is always connected with a hyperglucorachia, the sugar in the spinal fluid appearing a little more slowly, and slightly inferior in quantity to that in the blood. Observations on glycorachia, therefore, should be reported in relation to the glycemia present in a given case.—T. C. B.

ADRENALIN in the vomiting of pregnancy (L'adrénaline dans les vomissements incoercibles de la grossesse). Rathery (F.), Bull. d'obst. et gynéc. de Par., 1922, **11**, 215-219.

Rathery found that the administration of 1 mg. of adrenalin in 250 cc. of physiological serum subcutaneously, or from 1 to 2 mg. by mouth in the uncontrollable vomiting of pregnancy gave good results in a certain number of cases.—F. S. H.

The limits of exactness of the physiological control method for ADRENALINES. Richaud (A.), J. de pharm. et chim. (Par.), 1922, **25**, 369-373.

Three successive injections each of 0.03 mg. of adrenaline into the same animal, at 8 minute intervals, gave, respectively, 7.7, 9.2

and 9.9 cm. instead of equal increase of pressure (cf. Chem. Abst., **16**, 2385). The habitual average error in Cushny's method varies between 20% and 30%. Still, this method of determining adrenaline content will remain very valuable in the hands of the experienced. —Chem. Abst., **16**, 2574.

ENDOCRINE GLANDS in gynecology (Glandulas de secreção interna em gynecologia). Rosa (O.), Rev. dos Cursos de la Fac. de med. (Porto Alegre, Brazil), 1921, **7**, 82-91.

No new data.—F. S. H.

The action of ADRENIN upon guinea pigs (Untersuchungen über die tödliche Adrenalinwirkung am Meerschweinchen). Schmidt (L.), Ztschr. f. d. ges. exper. Med. (Berl.), 1919, **9**, 285-307; abst. Zentralbl. f. Biochem. u. Biophysik, 1920, **22**, 111.

A subcutaneous dose of 0.8 mg. per kg. of adrenin is fatal; an intravenous dose of 0.08 to 0.15 mg. per kg. causes multiple pulmonary hemorrhages and death. Previous administration of a sublethal dose within the preceding 24 hours lowers the fatal dose and leads also to pulmonary hemorrhages, repetition of which causes death.—R. G. H.

Vascular reaction to EPINEPHRIN in perfusates of various C_H. II. The portal-venous system of the liver. Snyder (C. D.) & Martin (L. E.), Am. J. Physiol. (Balt.), 1922, **62**, 185-191.

Perfusing the turtle's liver with Ringer's solution of varying H-ion concentration "shows conclusively that, with the H-ion concentration of a perfusing fluid set somewhat above that of the vascular blood of animals, epinephrin when given in minimal effective dosage is an inhibiting or a depressor agent. With the H-ion concentration set somewhat below that of the blood of the general circulation epinephrin given in the same minimal dosage still has the exciting or pressor action that is observed invariably for larger doses." The relation of these facts to the effect of epinephrin on the general blood pressure is discussed.—T. C. B.

Infantile tolerance to ADRENIN (Tolerancia infantil a la suprarenina). Soler (B.), Arch. españ. de pediat. (Madrid), 1922, **6**, 146-150.

The author describes a girl of 4½ years who had received 12-15 drops of adrenin thrice daily for 26 months without any ill effect. The drug had been given the father of the patient because of Addison's disease. Soler reviewed the therapeutic effects of adrenal preparations, but found no activity following the oral administration in this child.—C. H. G.

(ADRENIN) The action of vaso-constrictor substances on the blood vessels and pigment cells of the frog's web. II. Stepanov (G. T.),

J. russe de physiol., 1919, **2**, 103-115; abst., Physiol. Abst., **1920**, **5**, 487.

Adrenalin constricts the blood vessels and evokes or increases their spontaneous periodic contractions. The action of adrenalin does not depend on the central nervous system. The pigment cells contract when adrenalin or Ca salts are administered. **Pituitrin** does not contract the cells. These drugs were injected subcutaneously.—Chem. Abst., **15**, 2672.

The function of the sympathetic nerve supplying the intestine and the action of ADRENALINE. Tashiro (K.), Tohoku J. Exper. Med. (Sendai), 1922, **1**, 102-105.

Using cat's intestinal strips Tashiro obtained responses after the application of adrenaline which led him to the conclusion that in the sympathetic nerve supplying the intestine there exist, besides the inhibitory nerve fibers, fibers which convey augmentatory impulses, and that the circular muscle is supplied by the latter and the longitudinal muscle by both inhibitory and augmentatory fibers. Adrenine stimulates these nerve endings and whether it excites or inhibits depends upon its quantity.—F. S. H.

The paradoxical action of ADRENALINE on the pupil of the eye in animals after repeated treatment with that drug. Kato (T.) & Watanabe (M.), Tohoku J. Exper. Med. (Sendai), 1920, **1**, 73-82.

In cats which were previously treated with daily excessive hypodermic injections of adrenin for some weeks, the administration of a minute amount of the drug into the carotid gave rise to a constriction of the pupil. Intravenous injections gave no such effect. In the pupil of such treated animals constriction is usually observed after the instillation of adrenin. The paradoxical action of the drug on the pupil occurs only rarely in animals previously not treated with repeated administrations of adrenin. When the previous treatment has been by instillations instead of injections the further instillation of minute amounts is always followed by miosis lasting for 5 to 8 hours. The instillation of cocaine or **pituitrin** in the previously treated eye and of physostigmine produce effects less marked on the treated side than the non-treated. The paradoxical action is probably based on the altered chemism of the dilator muscles of the pupil.—F. S. H.

Vertigo and its treatment through ADRENALIN. Vernet (M.), Laryngoscope (St. Louis), 1922, **32**, 205-213.

The author uses adrenalin, 1 to 1000 solution, in doses of from 5 to 20 drops twice a day for the control of vertigo.—H. W.

Action of atrophine on the effects exercised by ADRENALIN upon blood vessels (Action de l'atropine sur les effets exercés par

l'adrénaline sur les vaisseaux sanguins). Wehland (N.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 774-776.

Perfusion experiments on the frog, by which it is again shown that atropin paralyzes the motor part of the sympathetic, and causes an inversion of the effects of adrenalin on the blood vessels.

—T. C. B.

Clinical observations on treatment and progress in DIABETES. Allen (F. M.) & Sherrill (J. W.), J. Metab. Research (Morristown), 1922, **1**, 377-434.

The authors call attention to the value of publishing full and frank statements of the results of treatment in diabetes and summarize in some detail their own findings over a number of years. They discuss also the results of treatment as followed by various other workers, especially those of Petrén and Newburg and Marsh. The principle of under-nutrition in the treatment of diabetes is strongly defended and it is pointed out from Allen's observations on his Rockefeller Institute Hospital series, followed since 1914, that mortality was much higher in cases with complications. Tuberculosis, the most serious of the complications, increases the hopelessness of the prognosis greatly in the young, but may often be kept under control in older patients when the diabetes is under control. The authors believe that sodium bicarbonate may be of benefit in combating acidosis if not used to extreme, and if employed only as an accessory to the methods employed for preventing the development of acids. The authors' method of treatment in diabetes consists of two phases. In the preliminary phase, the patient is put on a very low diet, consisting chiefly of proteins to which a small portion of carbohydrate is added in cases with acidosis and bulky materials without food value if the bowels need stimulating. The patient is kept on this diet until the blood sugar is normal, after which the diet is gradually increased, with blood sugar determinations as a guide, until the final diet is reached, which approaches as nearly as possible a maintenance diet for the particular patient under treatment. The principle underlying the treatment is functional rest to assist in conservation and regeneration of function. The work of Petrén and Newburg and Marsh, who sponsor high fat diets in the treatment of diabetes, is criticized adversely by the authors on the basis of their exceeding the total metabolic tolerance of the patient and aiding in the development of acidosis. Although dietary therapy, which preserves the normal blood sugar level, appears in many cases to check the progress of diabetes, the authors agree that it is too early to say finally that there is not a "spontaneous downward" course in this disease in spite of treatment.—I. M.

Experimental researches on DIABETES insipidus and dystrophia adiposogenitalis (Recherches expérimentales sur le diabète in-

sipide et le syndrome adiposogénital). Bailey (P.) & Bremer (F.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 925-927.

Camus and Roussy have shown that diabetes insipidus is due to lesion of the para-infundibular region and not to lesion of the hypophysis. The lesions were made by the buccal route. The authors have repeated the experiments using the temporal route of Paulesco and of Cushing. Even a minute lesion of the para-infundibular region of the hypothalamus provokes polyuria in dogs; it is transitory or permanent according to the extent of the lesion. If permanent, cachexia, genital atrophy and adiposity result. Permanent polyuria has all the characteristics of diabetes insipidus in man. Polyuria occurs after denervation of the kidneys, thus excluding vasomotor disturbances. Protocols of two experiments are given, with histological findings and location of the lesion. The meninges and the hypophysis were normal, and nothing indicated that the hypophysis was concerned.—T. C. B.

Pancreatic extracts in treatment of DIABETES MELLITUS. Banting (F. C.), Best (C. H.), Collip (J. B.), Campbell (W. R.) & Fletcher (A. A.), Canad. M. Ass. J., 1922, **12**, 141-146.

Believing that the active principle of the pancreas is destroyed by the digestive enzymes in the ordinary extracts of the gland, an extract was made with ice-cold Ringer's solution from degenerated pancreatic tissue removed ten weeks after the ducts were tied. Such extract, injected intravenously and subcutaneously into a diabetic dog, caused marked reduction in blood sugar and in the sugar in the urine. A completely diabetic animal was kept alive 70 days and then chloroformed. Control extracts of liver and spleen did not produce any effects. Later, one of these workers prepared an extract of the whole gland which was sterile, highly potent and could be injected subcutaneously in the human subject. Seven clinical cases are referred to which showed marked clinical improvement as well as reduction in the blood sugar and a rise in the respiratory quotient. A later report will be made on the method of making the extract. —J. H.

The effect of PANCREATIC extract (insulin) on normal rabbits. Banting (F. G.), Best (C. H.), Collip (J. B.), Macleod (J. J. R.) & Noble (E. C.), Am. J. Physiol. (Balt.), 1922, **62**, 162-176.

Insulin injected subcutaneously into normal rabbits causes the percentage of blood sugar to fall within a few hours. As a tentative basis for the physiological assay of insulin the authors consider as one unit the number of cubic centimeters which causes the blood sugar of normal rabbits to fall to 0.045% within 4 hours. This dose is decidedly active in lowering the blood sugar in diabetic patients. As the blood sugar falls the animals exhibit characteristic symptoms of hunger and thirst, hyperexcitability and fear. The animals may

recover but frequently have, with active preparations, clonic convulsions lasting several minutes, and the blood sugar is found to be about 0.045%. If they die there is a peculiar mucilaginous degeneration of the subcutaneous tissues of the abdominal wall. Injections of solutions of dextrose subcutaneously antidote the insulin and the rabbit is normal in a few minutes.—T. C. B.

(DIABETES) An improved alimentary glucose tolerance test. Beeler (C.), Bryan (A. W.), Cathcart (E. P.) & Fitz (R.), J. Metab. Research (Morristown), 1922, **1**, 550-560.

The authors undertook the task of improving the usual alimentary glucose tolerance test. Since atypical blood sugar curves indicating diminished tolerance have been reported in diabetes, diseases of the liver, obesity, nephritis, **hyperthyroidism**, cancer, rickets, arthritis, etc., the test has become very popular and doubtless has much value if properly controlled. Woodyatt, Sansum and Wilder, using the intravenous method, have pointed out that in some diseases what appears to be an increased tolerance or a delay in the rise of the blood sugar curve may be due merely to poor alimentary absorption. The present authors have, therefore, made a brief study of the factors of importance in absorption and apply these in their modification of the alimentary test. Both normal and diabetic subjects were given sugar in varying concentrations after gastric aspiration and then the stomach contents were aspirated one hour later to determine the amounts of sugar unabsorbed and the concentration of the remaining solutions. Hemaglobin and blood sugar determinations were made at the same time at intervals. It was found that absorption of the sugar was most rapid when the concentration of the solution given was between 10 and 20 per cent. Concentrated solutions were found to delay absorption and to draw fluid into the stomach from the blood stream, the hemaglobin of the blood increasing, due to the loss of this fluid. The suggested modification of the alimentary glucose tolerance test based on these findings and those of Woodyatt, Sansum and Wilder is as follows. A fasting subject is given 500 cc. of a 20 per cent glucose solution. One hour later the stomach is completely emptied and the amount of sugar contained is estimated. This subtracted from the quantity administered gives the amount absorbed in one hour. Blood sugar and hemaglobin determinations, which are made before glucose ingestion at the time the stomach is emptied and at later intervals, are employed for calculation of changes in blood volume. The results are made uniform by estimating from these data the proportional blood glucose values which would have been obtained under the same conditions outlined had 0.800 gm. of glucose per kg. per hour been given, the maximum dose found to be tolerated without producing glycosuria. Diabetics gave a typical curve in all instances.—I. M.

Effect on DIABETICS of lumbar puncture. Bickel (G.), Rev. méd. de la Suisse Rom. (Genève), 1922, **42**, 231-233.

Bickel reports a drop in the sugar in the urine after lumbar puncture from 83 to 38 gm. per thousand in a diabetic woman of 73. The sugar content of the blood, fasting, also dropped from 3.39 to 2.25 per thousand. Lhermitte recently reported an analogous observation. His patient was a man of 76, and the glucose in the urine dropped temporarily after lumbar puncture from 28.45 gm. to 0.72 gm., while the output of urine was only 1 liter instead of the preceding 2.5 liters.—J. Am. M. Ass., **79**, 1084.

The etiology of DIABETES, and its bearing on treatment. Cammidge (P. J.), Practitioner (Lond.), 1922, **108**, 396-402.

The author admits that the Allen fasting treatment is a distinct advance in the treatment of diabetes, but contends that some patients do not progress well under this method; rapidly increasing acidosis, nervous disturbances and ataxia sometimes result. Cammidge comes to the conclusion that not all cases of diabetes are due to **pancreatic** disease primarily, but that a fairly large group depends upon hepatic insufficiency and that this latter group does not respond well to the Allen treatment. He arrives at the differentiation by determinations of the difference between the percentage of sugar and total carbohydrate in a series of blood specimens taken at hourly intervals before and after a test breakfast. This he terms the "difference value" of the blood. The difference value curve and blood sugar curve are opposed in the typical pancreatic type, the former falling while the latter rises. Of 140 cases examined by this method 32 per cent gave this opposed pancreatic curve. Thirty-four per cent gave another type of curve which Cammidge reproduced in animals by interfering with liver function. Twenty-four per cent belonged in another group, showing a still different curve relationship, the cause of which he has not yet determined.—H. L.

The retinas of Bright's disease in DIABETES (Les rétinités brightiques des diabètiques). Cantonnet (A.), Progrès méd. (Par.), 1919, **34**, 468-469.

Presentation of cases of diabetes in which the retinitis was not of diabetic origin, but was probably nephritic since the urine contained protein, and the blood urea and pressure were high. The conclusion is drawn that all cases of retinitis in diabetes are not of diabetic origin.—F. S. H.

Massive doses of alkali in two cases of impending DIABETIC coma. Cary (W. E.), J. Am. M. Ass. (Chicago), 1921, **76**, 1393-1395.

In view of the much debated question of the use of alkalis in diabetic acidosis, Cary reports two cases in which massive doses of sodium bicarbonate caused definite subjective and objective im-

provement. The alkalis should be given by mouth when possible. In the first case, a man of 23 received 350 grams of sodium bicarbonate in 72 hours, with striking improvement subjectively and with a return of pulse and respiration to normal. The other patient, a boy of 15, received 240 grams in 43 hours with similar improvement. Both patients were on absolute fast during the period of this therapy. The carbon dioxide combining power of the plasma rose from 13.63 to 64.61, and from 14.31 to 45.83 per cent by volume, respectively, in the two cases. Cary concludes that the administration of sufficient alkali is beneficial, but warns against overalkalinization, which can be guarded against by examination of the urine or blood.—W. M. A.

Pleuro-pulmonary granulation clinically simulating typho-bacillosis in a DIABETIC (Granulie pleuro-pulmonaire a allure clinique de typho-bacillose, chez un diabétique). Caussade (G.) & Doumer (E.), Bull. et mém. Soc. méd. d. hôp. de Par., 1921, **45**, 942-949.

A case report not of endocrine interest.—F. S. H.

Mode of action of carbohydrate-free diets in cases of DIABETES (Du mode d'action des régimes anhydrocarbonés chez les diabétiques). Chabanier (H.), Lebert (M.) & Lobo-Onell (C.), Compt. rend. Soc. de biol. (Par.), 1921, **85**, 2-4.

Observations on 10 diabetics, 5 lean and 5 fat, especially in regard to the critical glycemia and the secretion threshold for sugar. The severity of the diabetes is indicated by the amount of blood sugar necessary to prevent acetonuria. Unless the acetonuria disappears there is no improvement.—T. C. B.

Report of two DIABETIC cases in the young. Davis (R. H.), Kentucky M. J. (Bowling Green), 1922, **20**, 576-577.

Rigorous treatment of diabetes in the young is productive of good results.—H. W.

Stabilization of the amount of GLYCEMIA in the dog during chloralose sleep (Stabilisation du taux de la glycémie chez le chien durant le sommeil chlorolosique). Dorlencourt (H.) & Paychère (A.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1078-1080.

During general anesthesia by chloralose the blood sugar equilibrium is relatively stable.—T. C. B.

The diet in DIABETES (Le régime alimentaire des diabétiques). Dumont (J.), Bull. Acad. de méd. (Par.), 1922, **87**, 721-724.

Dumont expatiates on the great advantage in diabetes of giving carbohydrates that generate levulose rather than glucose. Ever since 1915 he has thus guided the diet in about twenty cases annually, and gives the details of one typical case. With a weight

of 100 kg. the man averaged from 200 to 250 gm. of glucose daily in about 2,500 to 2,800 cc. of urine. Milk was dropped and bread reduced to 200 gm., and the glucose output declined to 135 gm. and to 106 gm. when boiled potatoes were given instead of bread. Then vegetables producing inulin (jerusalem artichokes, salsify and scorzonera or viper's grass) were taken to a total of 150 gm. at a meal, and the glucose increased only to 10.8 gm. on the ordinary diet. Then for three months the artichokes were resumed, and the glucose disappeared almost completely. As the end of the year approached, the urine averaged only 2.5 gm. of glucose. In another case the output was 200 gm. of glucose and there was a carbuncle on the head. The man was cured in a few weeks and the glycosuria disappeared after the carbohydrates were given in the form of artichokes. He says, "This valuable plant reeducates the intestine by the levulose it brings and the modification of the intestinal flora. Foods producing inulin and levulose seem to reenforce the defensive forces of the diabetic while supplying the elements necessary for energy and heat."—J. Am. M. Ass., **79**, 1000.

The dietetic treatment of surgical DIABETES. Ezell (J. J.), Kentucky M. J. (Bowling Green), 1922, **20**, 421-423.

In the presence of infections "operate first and starve and diet afterwards." In operations of choice best results are obtained by first making the patient sugar free.—H. W.

Artificial pneumothorax for pulmonary tuberculosis with coexisting DIABETES of unusual onset: report of case. Geer (E. K.), Am. Rev. Tuberculosis (Balt.), 1922, **6**, 399-401.

Geer reports two cases of pulmonary tuberculosis with coexistent diabetes in which pneumothorax induced with no untoward effects which could be ascribed to the diabetes. The thoracentesis wounds healed promptly after each refill. In one of the cases the diabetes manifested itself several months after the onset of the pulmonary lesion.—J. Am. M. Ass., **79**, 917.

Some observations and remarks on the Allen treatment of DIABETES MELLITUS. Hall (J. W.), N. Zealand M. J. (Wellington), 1921, **20**, 122-146.

Reference verified from Index Medicus.

Effect of insulin (PANCREATIC extract) on the sugar consumption of the isolated surviving rabbit heart. Hepburn (J.) & Latchford (J. K.), Am. J. Physiol. (Balt.), 1922, **62**, 177-184.

The average sugar consumption of the isolated rabbit heart perfused with Locke's solution was found to be 0.87 mgm. per gram per hour. When insulin of proved potency, as tested by its ability to lower the blood sugar in normal rabbits, was added to the per-

fusion fluid, the average sugar consumption rose to 3.06 mgm. per gram per hour. The average glycogen content of the treated and untreated hearts was practically the same.—T. C. B.

Widely distributed epithelial-xanthomata accompanying high-grade DIABETIC lipemia (Ueber weit verbreitete Haut-xanthomatose bei hochgradiger diabetischer lipaemia). Hoffman (E.), Deutsche med. Wchnschr. (Berl.), 1918, **44**, 1050-1052.

Differential diagnosis of benign glycosuria and of DIABETIC sugar by the aid of intravenous injections of glucose (Diagnostic différentiel des glycosuries bénignes et du diabète sucré, à l'aide d'injections intraveineuses de glucose). Joergensen (S.) & Plum (T.), Compt, rend. Soc. de biol. (Par.), 1922, **87**, 455-458.

Not of immediate endocrine interest.—T. C. B.

A trial of eucalyptus infusion in DIABETES. John (H. J.), J. Metab. Research (Morristown), 1922, **1**, 489-495.

Beneficial effects of eucalyptus infusions on diabetes have been claimed by a number of writers. The author reports the results of an attempt to test the validity of these claims under properly controlled conditions. Infusions of eucalyptus globulus obtained from southern California were given in large quantities over a long period of time to 20 diabetic patients, some with and some without the disease under control. The results were uniformly negative.—I. M.

(DIABETES) Glucose tolerance and its value in diagnosis. John (H. J.), J. Metab. Research (Morristown), 1922, **1**, 497-548.

The author briefly reviews the literature as to the clinical use of the glucose tolerance test and points out the important conditions in which abnormal curves have been reported. The special purpose of this communication was to show, judging from his experience with the method on 100 cases, the significant factors in the test, such as the height of the blood glucose curve, the possibility of delay in absorption in the intestine, the effect of nausea, the relation of water intake, previous fasting, etc., to the curve and the methods used for determining the blood sugar. Subjects vary considerably in their response to the test and the author placed the cases studied in 4 groups according to gradations of assimilation as follows: (1) strong normal, (2) normal, (3) weak normal or pre-diabetic, and (4) diabetic. Renal threshold is not a fixed value for all normal persons. Nausea produces a temporary lack of absorption from the stomach which is characterized by a dip in the curve. Restriction of carbohydrates improves the tolerance in diabetics and in pre-diabetics as seen from repeated blood glucose curves. The author concludes that the sugar tolerance test is very useful in revealing an important number of cases of early or latent diabetes at the stage most susceptible to treatment.—I. M.

The laboratory as an aid in the treatment of DIABETES. Jonas (L.), Penn. M. J. (Harrisburg), 1918-1919, **22**, 718-721.

Clinical determination of blood sugar and acidosis as guides in the management of DIABETES MELLITUS. Jonas (L.), Med. Clin. N. Am. (Phila.), 1918, **2**, 861-869.

The metabolism of DIABETES. Joslin (E. P.), Tr. Ass. Am. Physicians (Phila.), 1920, **35**, 85-87.

The total metabolism in diabetes is a varying factor, and, generally speaking, any definite statement in this regard has been avoided. However, it may be affirmed with reasonable certainty that the average metabolism of the diabetics studied in this country was increased prior to June, 1914 (the date of fasting experiments conducted by the author), and correspondingly decreased since that date. To a large extent these facts are explained by the severer cases in each group being those which were rigorously either over- or under-fed. If metabolism is above normal, there is a general tendency for it to rise with increasing acidosis. This relation does not hold in instances in which metabolism is decreased. It is possible that the extreme degree of undernutrition which was in process of development obscured the effect of the acidosis. The lower the respiratory quotient the higher the metabolism tends to rise. Other observations along these lines are in the making. The effect of the administration of levulose has been studied in 50 experiments on diabetes. The average of these experiments showed an increase of 17% in the metabolism. The more levulose given per kg. body weight, the greater the increase in the metabolism. Observations upon the metabolism in relation to the blood-sugar, blood-fat and non-protein nitrogen were also made. A distinct relation between the pulse and the metabolism was usually found. Besides the 50 experiments with levulose there were some 100 other food experiments. These data are to appear in a subsequent publication.—I. B.

Practical lessons for physicians and patients in DIABETES. Joslin (E. P.), Med. Clin. N. Am. (Phila.), 1921, **4**, 1723-1732.

This article contains many practical points on the pliability of the diet in diabetes as well as in health, the danger of fat to the diabetic, the critical period of hypoglycemia in undernutrition, and renal glycosuria. "Pliability of the diet" is a term peculiarly applicable to diabetes, because of the possibility of extreme variations from the normal of the proportion of carbohydrate, proteid, and fat that may be administered with benefit. Early cases will become sugar free with certain restrictions, but it is to the credit of F. M. Allen that undernutrition was shown to be the basic principle underlying restrictive methods in diet. Success is obtainable only through continuous prolonged observation of the patient and avoidance of

fads. The dietary treatment of diabetes may be divided into two epochs, that preceding and that beginning with June, 1914, the date when the method of undernutrition was introduced. Joslin states that the two epochs of treatment differ so widely that if methods employed prior to June, 1914, were adopted now, it would almost seem like malpractice, while, were the present method of undernutrition employed prior to this date, it would have seemed like an unjustifiable experiment. Obesity exists with the onset of diabetes in 75% of cases, and in some decades of life in 39 cases out of 40. Recognition of obesity as an etiological factor should lead to a reduction in the number of diabetics through prophylactic undernutrition. The old-fashioned method of restricting the carbohydrates and increasing the fat and protein in the diet frequently led to death of the patient in diabetic coma within a few days. When the total caloric value of the diet is low, a comparatively high proportion of fat often appears to be harmless; but when the diet is fairly liberal and the proportion of carbohydrate to fat falls below 1 to 5, harm almost invariably results. The discovery of the presence of hypoglycemia during the course of treatment by undernutrition is an important danger signal. The author cites cases emphasizing this fact. The subject of renal glycosuria has received much attention in recent years. A case in a man of 39 is cited, in which there was a large percentage of sugar in the urine during a period of 27 years. At present the blood sugar is normal under all conditions, and the patient appears to be in good health. The teeth, circulatory system, kidneys and eyes are normal. In concluding his remarks on this patient, Joslin says, "A case like the present encourages one to hope that renal glycosuria may yet be proved to be an entity."—I. B.

The feeding of non-ketogenic odd-carbon fats to DIABETIC patients. Kahn (M.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 265-266.

A synthetic fat as given in the title was fed to typical diabetic and ketotic patients. It was found that the fat was absorbed, that large amounts of it could be fed to these patients without inducing acidosis, and that the nutrition of such patients was improved.

—F. S. H.

The elimination of organic acids in the urine of DIABETIC acidosis (L' élimination des acides organiques dans l'urine des diabétiques acidosiques). Labbé (M.), Bith (H.) & Nepveux (F.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 446-447.

Not of immediate endocrine interest.—T. C. B.

A study in experimental DIABETES. The effect of intravenous injection of pancreatic perfusates on the D/N ratio following pan-

createctomy. Landes (H. E.), Garrison (L. E.) & Moorhead (J. J.), Arch. Int. Med. (Chicago), 1922, **29**, 853-866.

The D/N ratio was taken as a criterion for the carbohydrate consuming power of the animal. Dogs were depancreatized and the D/N ratios were determined daily. When these figures became rather constant for each animal, it was the plan to inject intravenously a quantity of fine dextrose dissolved in Tyrode's solution. Subsequent determinations of the D/N ratio should show the amount of dextrose retained after such injections. It was then proposed to perfuse the pancreas of a normal animal with Tyrode's solution containing dextrose, and to inject this perfusate intravenously, at the same rate, into an experimentally diabetic animal, with the expectation that the subsequent D/N ratios would show some change in dextrose utilization. This experiment was attempted on 15 dogs, but no conclusions could be drawn from the fluctuating figures. It was then decided to attempt to influence the onset and course of experimental diabetes by the intravenous injection of pancreatic perfusates alone. Twenty-seven dogs were used. Dogs injected immediately following pancreatectomy with 150 cc. of perfusate showed no delay in the onset of glycosuria, after which subsequent injections of perfusates produced no consistent change in the D/N ratio. Defibrinated blood drawn from pancreatectomized animals and passed once through the normal pancreas had no effect on experimental diabetes.—H. L.

Treatment of DIABETES and tuberculosis. Landis (H. R. M.) & Funk (E. H.), Am. Rev. Tubercul. (Balt.), 1922, **6**, 429-437.

Landis and Funk believe that these two diseases are more commonly associated than is generally considered, and that in practically all cases diabetes is the initial disorder and the active tuberculosis a subsequent development. The diabetes probably determines in most instances the development of tuberculosis in the person in whom both are found to be present. The authors are quite convinced that in that particular group of tuberculous patients in whom diabetes is present, weight increases have less significance, as far as the improvement of the tuberculous condition is concerned, than in others, and this is in keeping with knowledge of the prognosis of diabetes. The undernourished diabetic keeps well longer than one who tends rapidly to put on weight. The tuberculosis will improve even though there is no considerable gain in weight, if the diabetes remains under control at a given weight. The important point in regard to the fats is to know how to adjust the diet so that a maximum of fat may be given without disturbing the fat metabolism, with the resulting formation of ketogenic substances and acidosis. The ratio between fatty acids and glucose should not exceed 1.5 to 1. It is of first importance, therefore, to know that a given quantity of carbohydrate yields in the body 100%

glucose and no fatty acid, proteins yield 58% glucose and 46% fatty acid, and fat yields 10% glucose and 90% fatty acid. With this information it is possible to calculate the diet, so that the ratio of fatty acids to glucose of 1.5 to 1 is not exceeded.

—J. Am. M. Ass., **79**, 1073.

DIABETES and pregnancy. Lemann (I. I.), N. Orl. M. & S. J., 1922, **74**, 492-499.

Reports a case in which pregnancy caused an improvement in the diabetes. After reviewing the evidence it is concluded that all glucosurias of pregnancy are not diabetes mellitus. Many are innocent renal diabetes. The treatment of the pregnant diabetic is the same as that of the non-pregnant.—F. S. H.

DIABETES MELLITUS in the negro race. Lemann (I. I.), South. M. J. (Birmingham), 1921, **14**, 522-525.

The paper is based on a study of the patients admitted to the Charity Hospital of New Orleans from 1898 through 1919—a total of 261,609 cases. In the period from 1898 through 1909 the incidence of diabetes was: white patients, 0.72 per thousand; negroes, 0.47. From 1909 to 1919 the rate was: white patients, 1.4 per thousand; negroes, 0.86. The latter period shows an increase in rate per thousand shared by both races. There was no demonstrable relation between the occurrence of syphilis and diabetes.—J. C. D.

A case of infantile familial DIABETES with rapid progression (Un cas de diabete infantile familial à marche rapide). Lereboullet (P.), Blechmann (G.) & Blechmann (J.), Arch. de méd. d. enf. (Par.), 1922, **25**, 94-96.

A case of familial infantile diabetes with rapid progression. This was the fifth child in a family of six. The fourth child died at the age of 7 of acute diabetes of 9 months' duration following measles. The patient was watched with care, but no sugar was found in the urine until 15 days after an operation for appendicitis at the age of 9. The development of the diabetes was acute and progression rapid, the total duration of the disease being but 5 weeks. Physical examination was negative but for the glycosuria. The urine showed 80 grams sugar per liter.—C. H. G.

DIABETES and alveolar pyorrhea (Diabetes e pyorrhéa alveolar). Lima (C.), Rev. dos Cursos de la Fac. de med. (Porto Alegre, Brazil), 1921, **7**, 92-97.

A speculative discussion derived from observation on one case, concerning the possible relation between pyorrhea and diabetes on the one hand and diabetes and the thyroid on the other.—F. S. H.

Sugar content of blood in DIABETES. Lindblom (S.), Hygiea (Stockholm), 1919, **81**, 753.

The author theorizes to the effect that hyperglycemia is to a certain extent a useful phenomenon in diabetes. It seems to warn the sugar-forming and sugar-destroying organs that their activities must be regulated.—R. G. H.

Methods of study of early DIABETES. MacLeod (J. J. R.), Canad. M. Ass. J., 1922, **12**, 4-6.

The usual methods of measuring the defects of the utilization of carbohydrates of the body are criticised. Blood-sugar curves may be perfectly normal in incipient stages of diabetes. Sugar may be found in the urine of perfectly healthy subjects. The author also defines renal diabetes, and says cases of this disorder must be carefully differentiated from true diabetes.—J. H.

The value of fat in the treatment of DIABETES (Les graisses dans l'alimentation et le traitement des diabétiques: interpretation physiologique de la cure de jeune). Maignon (F.), Presse méd. (Par.), 1922, **30**, 265-267.

Maignon advocates the extensive use of fat in the treatment of diabetes. He shows that the ingestion of fat reduces both glycosuria and acetonuria and brings out the risk of the development of acidosis, because fats are indispensable for the proper utilization of protein and for the prevention of the abnormal cleavage of proteins which furthers acidosis. His first observation was made on a dog with extremely severe, spontaneous diabetes. It was emaciated and had intense glycosuria as well as a negative nitrogen balance. All of these symptoms disappeared and the animal's general condition improved to a remarkable extent after a few days of exclusive feeding with olive oil. Maignon points out that Allen's starvation treatment of diabetes is known to give excellent results in diabetics who do not show much loss of weight, and that it is far less beneficial to emaciated patients. The physiologic basis of this clinical observation is that the rapid disappearance of glycosuria in well-fed diabetics during starvation is caused by the burning up of the patient's body fat which is present in amounts sufficient to meet all the caloric requirements of the organism. But in the emaciated patient, starvation leads to the burning of the body proteins; as 44% of the proteins are converted into carbohydrates, which the diabetic cannot metabolize in severe types of the disease, glycosuria persists, while the wholesale and inadequate cleavage of proteins furthers acidosis. Several case histories of severe diabetes with improvement amounting to cure under the administration of large amounts of fat are given to illustrate the value of this method of treatment. The therapeutic measures used by Maignon are the following: (1) complete elimination of all carbohydrates from the diet, (2) reduction to a minimum of the intake of protein, (3) maintenance of the normal acidity of the urine by administration of sodium bicarbonate, and (4) adminis-

tration of fat in sufficient amount and in easily assimilated form to furnish the caloric equivalent of the normal carbohydrate requirements. For the latter purpose the following mixture has been found useful: oil of sesame 600 cc., distilled water 300 cc., washing soda 5 grams. This mixture is well shaken at intervals (without heating) during forty-eight hours; it is then allowed to stand for another forty-eight hours, after which the supernatant emulsion is poured off. To the emulsion which is partly saponified 20 grams of neutral glycerine as well as 0.02 gram of vanilla and "half a drop" of bitter almond oil are added to correct the taste. Maignon also points out that the unsatisfactory results of fat-feeding to **depancreatized** dogs, reported by Allen, are readily accounted for by the fact that removal of the greater part of the pancreas leads to disturbances of fat metabolism, because the pancreas plays an important part in the metabolism of fats, but that the activities of the pancreas, with regard to the handling of fat, are rarely curtailed in the spontaneous types of diabetes.—G. L.

The nitrogen requirement for maintenance in DIABETES MELLITUS. Marsh (P. L.), Newburgh (L. H.) & Holly (L. E.), Arch. Int. Med. (Chicago), 1922, **29**, 97-130.

Very carefully controlled dietary experiments on 12 diabetics were performed to determine the state of nitrogen equilibrium, the nitrogen in the food being balanced against the nitrogen in the urine and stools. The treatment used was the low protein, high fat, low carbohydrate diets previously described by Newburgh and Marsh, and concerning which there has been much controversy. The authors came to the following conclusions. Nitrogen balance can be established in the diabetic according to the laws of applicable to the normal subject provided his total caloric requirement can be satisfied. This implies that he can burn enough glucose to metabolize fat. Diabetics who cannot burn this small amount of glucose are extremely rare. Protein metabolism above the minimal is undesirable in the diabetic because of the great glycogenic property and the large specific dynamic action of protein. Excessive protein metabolism results from a diet containing either too much protein or too few total calories.—H. L.

DIABETIC coma cured by intravenous injection of bicarbonate of soda (Coma diabétique guéri par le bicarbonate de soude en injections intraveineuses). Minet (J.) & Boulet (L.), Réunion méd. chir. des hop. de Lille, 1922, June 19; abst., Presse méd. (Par.), 1922, **30**, 683.

A case is reported of a young girl of 20 years who had unrecognized diabetes for about 5 months. There was first vomiting and diarrhea, then torpor and finally absolute coma; respiration was the only sign of life. One intravenous injection of 500 cc. of a solu-

tion of bicarbonate of soda to 300 to 1,000 after 13 hours of coma resulted in recovery during the course of the injection. The result, maintained by enema of bicarbonate of soda and by second intravenous injection, appeared to be definite; the acetone odor disappeared shortly afterwards; the girl recovered complete consciousness in 6 days. The seventh day she slowly died, but without coma or new signs of acetonuria, showing a group of symptoms indicating acute **adrenal** insufficiency. The authors call attention to the extreme rareness of diabetic coma that is not immediately fatal.

—R. G. H.

DIABETES in children (Formes cliniques du diabète sucré chez les enfants). Nobécourt (P.), Médicine (Par.), 1922, **3**, 834-838.

Nobécourt warns not to mistake for glycosuria the alimentary lactosuria of infants with gastro-intestinal derangement. The mild form of diabetes in children can generally be cured by restricting carbohydrate intake, but sometimes it persists unmodified and without aggravation up to adult life. The child develops apparently normally. Sometimes the mild form changes to the grave form or the diabetes may be grave from the start, with a tendency to denutrition or to hypotrophy or both. The prognosis should always be reserved; the effects of treatment will generally tell the story.

—J. Am. M. Ass., **79**, 1554.

(DIABETES) Study of blood sugar curves following a standardized glucose meal. Olmsted (W. H.) & Gay (L. P.), Arch. Int. Med (Chicago), 1922, **29**, 384-399.

More than 200 cases were studied critically. The interpretation of the values of sugar curves depends on the following factors: (1) the technic of administration of the glucose meals; (2) the collection of blood samples; (3) the method of doing the blood sugar determination, and (4) the wide application of the test so as to learn the many factors which influence these curves. The standardized Janney glucose meal was used. Three types of curves are described: normal, showing a normal fasting blood sugar, a normal rise after the glucose meal, and a return to normal or slightly subnormal at the end of two hours; the subnormal curve, showing a hypoglycemia or normal fasting sugar and no hyperglycemia following the glucose meal; the sustained hyperglycemic curve, divided into two groups, those showing hyperglycemia the second hour but with a return to normal levels the third hour, and those showing hyperglycemia at the end of three hours. In **hyperthyroidism** marked hyperglycemia resulted after the glucose meal, with return to normal level in three hours. There is no relationship between the height of metabolism (basal metabolic rate) and the height of the blood glucose curve. Hypothyroid cases constantly showed hypoglycemic curves, probably due to increased sugar storage, rather than delayed

intestinal absorption. **Hypopituitarism** produced hypoglycemic curves. The high sustained curve even in mild diabetes was invariably found. Two cases of renal diabetes gave flat curves. No prediction as to the type of curve in mental disease can be made. Normal or flat or high curves may be obtained in hysteria, neurasthenia, dementia, praecox, hypochondria, etc. Abnormal curves, though quite inconstant, may be obtained in chronic infections, malignancy, pernicious anemia, leukemia and Hodgkin's disease.—H. L.

Significance of DIABETES MELLITUS in mental disorders. Pike (H. V.), J. Am. M. Ass. (Chicago), 1921, **76**, 1571-1572.

The relation of mental disorders to disturbances of metabolism, especially glycosuria, is briefly discussed. Pike reports two cases of diabetes mellitus occurring in patients suffering from mental disease, but in which the somatic condition was in no sense contributory to the psychosis. A third case presented the picture of a psychosis consequent to the development of diabetes mellitus.

—W. M. A.

Clinical importance of BLOOD SUGAR (Zur Klinischen Bedeutung des Blutzuchers). Schirokauer (H.), Deutsche med. Wchnschr. (Berl.), 1922, **48**, 1034.

Offenbacher and Hahan have stated that blood sugar must be estimated in the blood and not in serum. Schirokauer shows that this gives rise to serious mistakes, and that only the study of the serum is of clinical importance.—J. K.

Non-surgical duodeno-biliary drainage in DIABETES and hypertension cases. Selman (J. J.), Martland (H. S.) & Synnott (M. J.), J. Metab. Research (Morristown), 1922, **1**, 357-376.

Because a small proportion of diabetic patients give a history of disease of the biliary tract the authors undertook to determine the incidence of biliary infection and the effect of biliary drainage by means of the Lyon method, carefully followed out. Fifty-three cases of diabetes and 3 of arterial hypertension were studied. The bile was studied grossly, microscopically and culturally. It was found that 49 of the 53 diabetic and 2 of the hypertension cases were free from biliary infection, which confirms the belief that diabetes is usually due to a blood borne, rather than to ascending duct, infection. Drainage of the bile passages in 2 of the cases with infection appeared to exert a favorable influence on the diabetes. The Lyon method is recommended as a means of determining the presence of biliary infection in suspected cases.—I. M.

Antiketogenesis. IV. The ketogenic-antiketogenic balance in man and its significance in DIABETES. Shaffer (P. A.), J. Biol. Chem. (Balt.), 1922, **50**, 26-27.

An extensive technical, biochemical discussion of the method of calculation and applications of the principles of the ketogenic-antiketogenic theory in relation to the regulation of the diet of diabetics. The final equation recommended is: Total calories of metabolism minus $\frac{\text{(urine nitrogen x 100)}}{50}$ equals the minimum food carbohydrate in grams. The equation is used as follows. Estimate from the size, weight and activity of the subject his approximate metabolism for 24 hours. If necessary, determine the amount of urine nitrogen on the amount of food protein decided upon; or tentatively assume the nitrogen equilibrium on 0.75 to 1.0 gram food protein per kilo, and confirm it later after the diet is established. Include in the diet the calculated amount of starch or preferably double this quantity (or more if the diabetes is not severe). Supply the rest of the calories needed in the form of fat. On theoretical grounds the food should be evenly distributed throughout the day in even small meals. If on such a diet "optimum" thus determined the subject shows glucosuria and ketosis, it obviously means that the carbohydrate tolerance is lower than necessary for the amount of the materials metabolized, and the only recourse is to decrease the total metabolism. This can be accomplished only by muscular rest or by undernutrition or both.

—F. S. H.

Acute infection of the PANCREAS. Sweet (F. B.), Boston M. & S. J. 1921, **184**, 137-140.

Diagnosis and report of cases.—H. W.

(DIABETES) Disturbances of carbohydrate metabolism. Warvel (J. H.), Proc. Indiana State M. Ass., 1922, Sept., 28-30.

Sugar in the urine calls for medical supervision. A physiologic glycosuria may soon adjust itself. If it is an endocrine condition it is not so likely to be serious in itself, and will disappear if the etiologic factor can be relieved. A persistent glycosuria may be either a "renal" diabetes or a true diabetes. The seriousness of "renal" diabetes is questionable, as these cases have not been studied over a long enough period of time. Diet does not influence the glycosuria in these cases. Blood sugar determinations are of value in establishing the glucose tolerance of the patient and in studying the influence of diet and medication when the urine is free from sugar. Quantitative sugar estimations of the urine are of value when made on twenty-four hour specimens of urine. Any person showing an occasional positive test for sugar in the urine should have a blood sugar examination. In this way lowered glucose tolerance may be detected, and the physician has the opportunity to reduce the patient's carbohydrate ingestion. This may be the one big factor in allowing an overburdened pancreas to establish its balance, thus preventing a future case of diabetes mellitus.

—J. Am. M. Ass., **79**, 1546.

Studies of the metabolism of DIABETES. Wilder (R. M.), Boothby (W. M.) & Beeler (C.), J. Biol. Chem. (Balt.), 1922, **51**, 311-357.

The complete metabolism of a patient with severe diabetes is reported for a period of 74 days. From studies made of this and other patients it was found that the basal respiratory quotients averaged 0.693 with a range from 0.74 to 0.65. The ingestion of food resulted in an inexplicable immediate fall in the quotient. The post-absorptive or basal metabolic level of the diabetic is materially affected by the previous diet. The ingestion of protein raises the level. In undernourished patients the basal level may be as much as 32% below the normal DuBois standard. In well nourished patients it does not exceed the normal limits, unless the patient is on a high protein diet or has some complicating affection. Acidosis itself does not appear to elevate the rate. When there is observed a basal metabolic rate in an emaciated person which is higher than the normal DuBois standard it is evidence that the diet is excessively rich in protein (or calories) or that the patient has been for so long a time on a diet so low in calories that he is in a critical state of starvation and calling on his body proteins to meet energy requirements. The critical or fatal D:N ratio of 3.65 has the prognostic significance in diabetes originally attributed to it by Lusk, provided the diabetes is uncomplicated. The sugar tolerance of the diabetic patient is depressed by high calorie, luxus diets, but much more markedly depressed by protein than by isocaloric amounts of fat. The glucose tolerance varies inversely with the basal metabolic level. This behavior seems to indicate a definite interrelationship of the two. From other experiments it is suggested that the proportion of fatty acid which will completely burn with a limited amount of metabolizing glucose is not the same at all metabolic levels but may be increased by measures designed to depress the basal metabolic rate.—F. S. H.

(ENDOCRINE GLANDS) Choline as hormone of intestinal peristalsis. VII. Choline content of the alimentary canal in hunger and after morphine (Choline als Hormon der Darmbewegung. VII. Cholingehalt des Magendarmkanales im Hunger und nach Morphin). Arai (K.), Arch. f. d. ges. Physiol. (Berl.), 1922, **195**, 390-409.

The choline content of the stomach and small intestine was determined by one-hour dialysis and the action of the concentrated dialysate on rabbit's intestine was studied. Normal cats gave very constant values. The amount present in cats' stomachs and intestines after 17, 48 and 90 hours' hunger was the same as immediately after feeding. The choline content in dogs' stomachs and intestines is distinctly decreased after subcutaneous injection of 6 mg. per kg. of morphine, but there is no difference in the sensitive-

ness of isolated intestinal strips of normal and morphinized dogs to stomach- and intestine-dialysates of normal and morphinized dogs. In cats, 6 mg. per kg. of morphine produces a slight decrease of the stomach-choline, 20 mg. per kg., a marked decrease in both stomach and intestine content; 1 mg. per kg. is without effect. After colocynth-diarrhea, the choline-content is not altered in cats. Stopping the diarrhea by morphine, with complete intestinal standstill slightly lessens the stomach-choline, but does not affect the intestinal content; such action cannot be due to choline-loss.

—A. T. C.

(GONADS) ENDOCRINE tissue in the TESTICLE of the urodele (Sur l'existence et le rôle d'un tissu endocrinien dans le testicule des urodèles). Aron (M.), Compt. rend. Acad. d. sc. (Par.), 1921, **173**, 57-59.

The authors believe that this tissue is analogous to the interstitial tissue of mammals and birds. They describe its histological structure; it begins to form before spermatogenesis occurs, and the nuptial period coincides with its fullest development. Destruction by cautery leaving the seminiferous tubes intact leads to a disappearance of sexual appetite and of secondary sexual characters.

—Physiol. Abst., **6**, 384.

(ENDOCRINE GLANDS) The foundations of hormone therapy (Grundlagen der Hormonentherapie). Asher (L.), Schweiz. med. Wchnschr. (Basel), 1920, **50**, 1057-1060.

Hormone therapy has its foundation in the totality of scientific biology, particularly in the biochemical and biophysical methods of practical physiology. On the basis of this definition Asher presents a generalized discussion of the action of the hormones, in which the secretions of the **thyroid, adrenals, hypophysis, gonads,** etc., are emphasized.—F. S. H.

The action of extracts and products from the glands of INTERNAL SECRETION on the isolated uterus, particularly after total castration (Action d'extraits et produits dérivés d'organes à sécrétion interne sur l'utérus isolé, particulièrement après la castration totale). Athias (M.), Arch. internat. de pharm. et therap. (Brux. & Par.), 1920, **25**, 423-452.

The uterus from rabbits, cats, dogs and hedgehogs shows the same diminution of automaticity after total castration as does that of the guinea-pig. The normal isolated uterus from non-castrated animals reacts through its tonic function to **adrenin** and **adrenal** extracts, to extracts of the **hypophysis** and **ovary** by transitory phenomena which are often accompanied by modifications in clonic function. The response to adrenin is that already described by other workers. The response to extracts of the hypophysis is a

shortening. Ovarian or **corpus luteum** extracts act as stimulants. The reaction to the various substances is the same for the uterus from the normal and from the castrated animal.—F. S. H.

The relation of the INTERNAL SECRETIONS to metabolism. Aub (J. C.), J. Am. M. Ass. (Chicago), 1922, **79**, 95-98.

In a survey of the literature with a brief reference to work from the author's laboratory, already reported and soon to be published, Aub reaches the following conclusions. Apparently the two glands which most influence the total metabolism are the **thyroid** and the **suprarenal** (probably by epinephrin). The mechanisms of their actions are independent of each other. The theory is advanced that the suprarenals exert acute effects, while the thyroid is the more sluggish regulator of the metabolic rate. The method of action of thyroxin and epinephrin is probably a direct one on the tissue cells.—W. M. A.

(ENDOCRINE) Case of hirsutism with melancholia (Un cas d'hirsutisme avec mélancolie). Ballif (Charlotte), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1920, **2**, 43-44.

The relation of the ENDOCRINE glands to heredity and development. Barker (L. F.), Science (N. Y.), 1922, n. s. **55**, 685-690.

A general address given before the Eugenics Research Association.—F. A. H.

ENDOCRINOLOGY. Barker (L. F.), J. Am. M. Ass. (Chicago), 1922, **79**, 89-91.

The conception that the endocrine organs are linked together so as to form a system of reciprocally dependent organs (hormonopoietic system), Barker states, has gradually gained general credence, not only among clinicians, but also among physiologists and pathologists. And it must be admitted that there is considerable evidence in favor of the existence of such a correlative interdependence among the several incretory glands. Physiologists, through their experiments, have adduced many facts that point to manifold interrelationships between the glands of internal secretion. And clinical-pathologic studies have shown that uniglandular endocrinopathies are rare, whereas pluriglandular endocrinopathies are common. In exophthalmic goiter, for example, we see not only diffuse hyperplasia of the thyroid gland, but also, not infrequently, hyperplasia of the thymus as well as signs of insufficiency of the gonads. In Froehlich's syndrome, to cite another instance, we see not only the signs of a disorder of the hypophysis cerebri, but also evidences of hypogenitalism. It seems very probable, therefore, that in the chemical integration of the bodily activities a certain co-operation among the endocrine organs is essential. The hormonopoietic system is concerned as a whole. It, like the nervous system, helps to correlate

the partial systems of the body into a harmonious unity. Though the principles of therapy for the endocrine diseases are not hard to grasp, the application of these principles in practice is compulsorily restricted, owing to the fragmentary character of existing knowledge. When, through constitutional deficits, or, under the influence of unfavorable conditions disharmonies of the hormonopoietic system arise, and evidences of hyperfunction, of hypofunction or of dysfunction, of one or more of the single endocrine organs appear, therapeutic intervention may become desirable. When a disease process has already developed; in other words, when an endocrinopathic personal variant has become incapable of satisfactory adaptation (state of irresponsivity), the physician may attempt to decrease function here, to increase function there, or to modify function elsewhere, in the hope of restoring balance, and of bringing the powers of personal adaptation again within the limits of normal responsibility. Thus, in hyperfunction of an endocrine organ it may be desirable to excise a portion of it, or to curtail its activity by diminishing its blood supply (ice-bag; arterial ligation); or, by means of a depressive radiotherapy or chemotherapy. On the other hand, in the case of hypofunction, it may become desirable to resort to organ transplantation, or to a substitution therapy (administration of gland substance, or of gland extracts, or of isolated hormones), or to attempt to revive a failing function by a dietetic hygienic regimen, or by mild stimulative radiotherapy.—Courtesy Am. M. Ass.

ENDOCRINE growth disturbance; acromegaly, gigantism, dwarfism. Bassoe (P.), Med. Clin. N. Am. (Phila.), 1921, 5, 85-100.

A practical review of this subject, with mention of a few illustrative cases. Though pluriglandular dysfunction may lead to growth disturbances, the most striking cases are due to pituitary disease with or without **thyroid** and **gonadal** involvement. A lack of hypophyseal secretion, as in the case of teratoma or congenital cyst of the organ, leads to so-called hypophyseal dwarfism with arrested sexual development and ossification (infantilism). Infantilism, however, may occur without stunting of growth, and indeed may occur with gigantism. Castration early in life presents disproportionately long extremities, small head with compensatory enlargement of the hypophysis, a small thyroid, a **thymus** persisting beyond the normal period, a thick growth of hair on the head but with lack of beard and pubic hair, small larynx and absence of the usually expected vocal changes. In gonadal deficiency due to congenital tumors of the **testicle**, hyperpituitarism may occur, resulting in extremely rapid growth as in the case of Sacchi, a boy who was also sexually mature at nine years. By eunuchoidism is meant a developmental disorder resulting from defective testicular interstitial glands, in which the characteristics of the eunuch are also present; excessive deposits of fat in these cases implicate the **hypophysis**, and carious

teeth with marked skin changes involve the thyroid. With regard to acromegaly and gigantism, Bassoe lays down the following general rules. 1. There are no "normal" giants. 2. All cases of gigantism belong in one of the following groups: (a) gigantism with infantilism, (b) gigantism with acromegaly, (c) gigantism with infantilism and acromegaly. 3. When gigantism and acromegaly are combined, the former condition appears first. 4. About half of all reported giants have had acromegaly. 5. Both gigantism and acromegaly are due to hyperfunction of the hypophysis; when this occurs in childhood or early youth a giant is produced, while after the epiphyseal lines have closed, acromegaly results. Aside from indications of pituitary disease, there are, in acromegaly, amenorrhea and other genital disorders, abnormal pigmentation, growth of hair and other skin changes implicating the gonads, the adrenals and the thyroid. In addition to extreme skeletal growths, the enlargement of the hypophysis per se gives rise, because of pressure, to changes in the visual fields, and occasional atrophy and blindness, and in extreme cases to the usual symptoms of brain tumor. The prognosis of acromegaly varies with the form of the affection. The severe form is fatal in a few years; the usual chronic form terminates in from eight to thirty years, while the benign form does not shorten life. The disease may be active for a few years and then remain stationary during the remainder of the patient's life, in which cases the age of one hundred years is known to have been reached. Treatment during the active stage is futile, and the administration of glandular extracts may aggravate rather than relieve the symptoms. If later there are evidences of hypopituitarism, pituitary opotherapy is indicated. X-ray treatment has been tried with asserted success in many cases. Surgery has now attained a place and deserves attention in active cases. The author classifies dwarfs as follows: 1. Proportionate dwarfs: (a) Primordial dwarfs (essential microsomia), (b) Hypophyseal dwarfs; and 2. Disproportionate dwarfs: (a) Achondroplasia (chondrodystrophia fetalis), (b) Stunting of growth from rickets or Pott's disease, (c) Cretinism, and (d) Congenital syphilis. Primordial dwarfism is congenital; the cause is unknown, and no endocrine or other etiological factor has so far been demonstrated. These individuals appear like normal people seen through the large end of a telescope. Though a "normal" giant does not exist, we must admit the existence of a "normal" dwarf. The hypophyseal dwarf is the antithesis of the acromegalic giant; they are small but proportionate, have too little hypophysis tissue, and do not acquire normal sexual or osseous development. Cases of achondroplasia are also congenital, presenting a relative shortness of the extremities with relatively large, broad heads and a tendency to precocious sexual development.—I. B.

(ENDOCRINE) The effects produced by extracts of PINEAL, ADRENALS, LIVER, TESTICLE, and OVARY, injected into the lateral

ventricles of the brain (Effects produits par les extraits de la glande pinéale, des capsules surrénales, du foie, du testicules et de l'ovaire injectes dans les ventricules lateraux du cerveau). Battelli (F.) & Stern (L.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 755-756.

In rare cases extract of beef pineal produces in the dog a state of excitation immediately after injection, which soon gives way to somnolence and true sleep, analogous to that produced by the hypophysis but less pronounced. After several hours the animal recovers its normal aspect. The temperature is slightly elevated. In the guinea pig the rise is preceded by a transient fall. In the guinea pig the suprarenal cortex often causes a slight initial excitation followed by depression more or less prolonged. The temperature is lowered. Death often occurs in 24 hours. In the dog there is no immediate effect, but sleep soon comes on, lasts several hours, and gradually disappears. In the guinea pig the suprarenal medulla causes paralysis varying with the dilution. The temperature is lowered. The same is true for the dog: somnolence, slow respiration, diminution of temperature, recovered from in a few hours. These effects are probably due to adrenalin. Extract of beef liver causes almost immediately muscular contractures and subsultus either spontaneous or upon excitation. Soon the dog rests upon its flank, but does not sleep; the reflexes are sometimes exaggerated. Recovery occurs in a few hours. Boiled extract acts more rapidly than fresh extract. The guinea pig testicle produces in the guinea pig either immediately or after several minutes, a state of agitation, vivacity, exaggeration of sensibility with a tendency to contractures. Recovery is rapid. In the dog there are no appreciable effects. Extract of cow's ovary gives inconstant effects—sometimes no result, sometimes excitation. In some dogs there was vomiting, and in one intense polypnea. The temperature was augmented. In a general way the glands may be classified into those predominantly depressing: the posterior lobe of the hypophysis, the pineal gland, the suprarenals; and those whose action is predominantly exciting: the thyroid, liver, spleen, testicle and ovary.—T. C. B.

ENDOCRINOLOGY: The neurologic phase. Bitler (C. C.), Proc. Indiana State M. Ass., 1922, Sept. 28-30.

For practical purposes, the human nervous system may be divided into three levels of activity—the vegetative, the sensorimotor and the psychic. In the region of the vegetative neurology a rich variety of disturbances is found, involving the glandular, gastrointestinal, genito-urinary, vascular, respiratory, muscular, cutaneous and bony systems. In addition, there are certain complex groups involving, for the most part, the glands of internal secretion—the endocrinopathies. Clinical syndromes resulting from disease of the glands of internal secretion are almost always pluriglandular. There

is a close relationship between the glands of internal secretion and their products, and the vegetative nervous system.

—J. Am. M. Ass., **79**, 1545.

The diagnostic and therapeutic rôle of the ENDOCRINES in functional diseases. Blumgarten (A. S.), N. York M. J. (etc.), 1922, **115**, 393-401.

After reviewing the history and establishing the rationale of endocrinology, the author proceeds to apply its principles to the pathogenesis of functional diseases. In discussing gastric neuroses he cites a case in which definite gastric symptoms and later frank **thyroidism** developed following a hold-up scene. "The sudden shock disturbed the cerebral and **adrenal** cortical relationship, producing adrenal insufficiency with compensatory hyperthyroidism manifesting itself at first by the gastric symptoms and later by the hyperthyroidism in addition." In a second case a man developed hyperthyroidism a month after recovery from scarlet fever. He suffered from gastric neurosis and hyperacidity. "In this patient the adrenal injury produced an adrenal insufficiency with compensatory hyperthyroidism, which began with gastric symptoms." "Cases of hyperacidity should be treated as cases of hyperthyroidism." In addition to rest, diet and stabilization of the emotions the author gives adrenal cortex—"the value of which I cannot emphasize too much"—"to overcome the underlying hyperthyroidism, for by overcoming the hyperthyroidism the vagotonic state is relieved. In the cases of anacidity and achylia gastrica, brilliant results are obtained by recognizing the thyroid deficiency and feeding these patients small doses of thyroid extract." Neurasthenia, or "adrenal-asthenia," is characterized by profound asthenia, lack of sympathetic tone, gastric neuroses and low blood pressure. "Consequently, it is being more and more appreciated that what we are dealing with in neurasthenia is an endocrine disturbance characterized by an adrenal insufficiency." Amenorrhea may result because of thyroid deficiency, dominance of the adrenals, in which case there are more or less masculine tendencies, and because of pituitary insufficiency; there is also loss of ovarian function. Metrorrhagia and menorrhagia occur either associated with hyperthyroidism or pituitary manifestations. Those of the first class should be treated for hyperthyroidism by adrenal cortex, atropin and sedatives. Those of the second class are often relieved of their pituitary headaches and dysmenorrhea by the use of pituitary extract, atropin and sedatives. Primary ovarian developmental deficiencies are difficult to recognize. "They are frequently associated with masculine characteristics. The secondary deficiencies, however, are usually associated with evidence of pituitary deficiency, usually in the Froehlich type of patients, associated with amenorrhea and infantile uterus." "The results of therapy in these cases cannot be predicted, and for the most part are unsuccessful."—H. W.

(ENDOCRINE) Mode of action of SECRETIN. Dalmau (M.), Treb soc. biol. Barcelona, 1917, **19**, 327; Physiol. Abst., 1919, **2**, 527.

The liver had no influence on the quality and quantity of the **pancreatic** juice, which was produced by administration of dry secretin.—Quoted.

(ENDOCRINOLOGY) Nomographic charts for the calculation of the metabolic rate by the gasometric method. Boothby (W. M.), & Sandiford (R. B.), Boston M. & S. J., 1921, **185**, 337-354.

Presentation of nomographic charts by which the calculation of the basal metabolic rate from the data obtained by the gasometer method can be made graphically in less than 5 minutes without the use of logarithms. The methods of construction and use of nomographic charts are given in detail.—H. W.

(ENDOCRINE) The alchemy of animal extracts. Bowers (E. F.), Trained Nurse [etc.] (N. Y.), 1921, **67**, 37; 119.

Reference verified from Index Medicus.

The biology of the ENDOCRINE system. Brown (W. L.), N. York M. J. [etc.], 1922, **115**, 373-376.

Save for the medulla of the **adrenals**, the islets of the **pancreas** and the doubtful instance of the **pineal**, the endocrine glands represent modified nephridia. In worms and lowly arthropods paired nephridia open externally from each segment. When appendages are developed these form the coxal glands at their base. With the modification of these appendages the corresponding glands become modified. The prosomatic ones become the **pituitary**, the mesosomatic become the tonsils, **thyroid, parathyroids** and **thymus**, and the metasomatic ones the adrenals. Only the hindmost retain their original excretory function, becoming conglomerated into the metanephros, and instead of opening separately to the surface they drain into the metanephric duct. The pronephros and the mesonephros of the primitive vertebrate kidney vanish in so far as the latter gives rise to **interstitial cells**, and their ducts are annexed by the **gonads**. The close anatomical relationship between the kidneys and the adrenals is thus comprehensible. The formation of the new alimentary tract (theory of Gaskell) and the plural folds shut off the anterior nephridia from the surface and force them to become ductless. Nephridia containing lymphatic structures and some of these which had thus been shut off develop this lymphatic element at the expense of the glandular, but in their phagocytic properties still show their association with excretory functions. Others acquire new secretory functions, though in some instances still showing chemically a vestige of their primitive secretory action. The endocrine functions which are the specialization of the old chemical method of stimulation and defense become concentrated in these structures

which perforce have to change their functions. Gradually these chemical methods come largely under control of the sympathetic nervous system which correlates them and enables them to be brought rapidly into action either for the ordinary processes of metabolism or for external and internal defense.—H. W.

A critical consideration of ENDOCRINE therapy. Cannon (W. B.), Boston M. & S. J., 1922, **187**, 163-164.

This article is a brief discussion of the fallacies on which some of our present endocrine treatment is based; together with a plea for careful and critical use of endocrine products. No new data are given.—J. C. D.

Some conditions controlling INTERNAL SECRETION. Cannon (W. B.), J. Am. M. Ass. (Chicago), 1922, **79**, 92-95.

No one, says Cannon, may now question the great influence of the glands of internal secretion on important physiologic processes. There appears to be a tendency just now, however, to pay these glands not only respect, but also deference, homage and a blind worship. The physiologist regards the body as a system of organs, each performing its service, each influenced by other organs and capable in turn of influencing other organs, and each having a use and a value only in relation to the others. Questions now arise regarding the real status of the glands of internal secretion. If they have not the dominant position commonly assumed for them, how may they be subordinated? What influences can be brought to bear on them in such a way as to modify their activity? These are important questions to have answered—important because of the profound effects which the ductless glands themselves are capable of exerting. Cannon presents some of the evidence for physiologic control of the internal secretions. He points out that bodily functions are managed by a system of checks and balances—by mutual adjustments, such as those between antagonistic muscles, and by maintained equilibria, such as those between material income and outgo, and between acid and base in the blood. If the endocrine glands are regarded as the regulators of important physiologic processes, normally they are well regulated regulators.

—Courtesy Am. M. Ass.

Studies on the conditions of activity in ENDOCRINE GLANDS. XI. Further evidence for reflex and asphyxial secretion of ADRENIN. Cannon (W. B.) & Carrasco-Formiguera (R.), Am. J. Physiol. (Balt.), 1922, **61**, 215-227.

After cutting the hepatic nerves blocking the venous path from the adrenals in such a way that the only change is a shutting of the adrenal blood from the circulation, the reflex response is prevented. If the venous block is removed the response is again ob-

tained. Asphyxia for 45 seconds fails to produce an increased rate of heart beat if the venous flow from the adrenals is prevented.

—T. C. B.

Hypofunction and hyperfunction of the DUCTLESS GLANDS. Carlson (A. J.), J. Am. M. Ass. (Chicago), 1922, **79**, 98-104.

No single phase of endocrine dysfunction, Carlson asserts, is satisfactorily worked out today, either clinically or experimentally. He presents the established facts and what appear to be obstacles to progress—baseless speculation and uncritical practice. The credit for progress made and the blame for errors committed are shared by the clinical and laboratory groups. Failure to recognize the complexity of every endocrine problem is a serious obstacle to victory. Following the hormone theory alone may, in the case of some of the ductless glands, lead way off the main road. Carlson believes that much of the glandular therapy of today, however harmless to the patient, injures the good name of the medical profession with intelligent laymen. He says: "We cannot practice quack methods and escape the just censure of society. The quack diagnoses every ailment with ease, and offers remedies for every disease with assurance. The good physician knows that he is neither omniscient nor omnipotent in the field of disease; and the educated layman knows this as well as the physician. Then, why pretend? Bluff may succeed for a time, but honesty is better for society; and what is best for society is best for the medical profession."

—Courtesy Am. M. Ass.

ENDOCRINE tumor of the appendix (Des tumeurs ENDOCRINES de l'appendice). Cazin, Paris Chir., 1919, **11**, no. 3; abst., Presse méd. (Par.).

In 1914 Masson showed that two kinds of cancer of the appendix could be distinguished: cylindrical epithelioma of the ordinary intestinal type, and tumors proceeding from the endocrine gland of the intestine. The latter are different in that they have an abnormal proliferation of the submucous tissue, made up of special "argentaffines" cells. These cells are normally scattered throughout the small and the large intestine and altogether form a diffuse endocrine gland of endodermic origin. Tumors derived from this tissue are of a compact texture; they are formed from connected, intertwined, anastomoses, made up of small polygonal cells. Sometimes these cells disclose their endodermic origin by vestiges of cavity formations, covered by cylindrical epithelium; in other cases they grow in compact groups. In spite of these characteristics of malignant histology these small neoplasms can be classed among the benign tumors. Cazin operated upon a tumor of this kind in a young woman of 28 years whose clinical history was that of ordinary chronic appendicitis. The appendix appeared normal exteriorly, but

showed on section a nodule, about 3mm. in diameter, between the muscular and the mucous membrane. Under the microscope this nodule showed all of the characteristics of the endocrine tumor described by Masson.—R. G. H.

(ENDOCRINE GLANDS) Congenital anlages in pluriglandular insufficiency (Zur Frage der kongenitalen Anlage bei pluriglandulärer Insuffizienz). Curschmann (H.), Ztschr. f. d. ges. Neurol. u. Psychiat. (Berl. u. Leipz.), 1920, **59**, 264.

The author disputes the statement of Krabbe that his two cases of congenital pluriglandular insufficiency are unique in the literature, and proceeds to cite an imposing list of such abnormalities. Cited from Schweiz. med. Wchnschr. (Basel), 1922, **52**, 662.

—F. S. H.

(ENDOCRINE GLANDS) Osteitis deformans: Paget's disease of the bones. DaCosta (J. C.), Tr. Coll. Phys. (Phila.), 1920, **42**, 52-67.

Paget's disease is apparently a distinct malady though closely related to osteomalacia and von Recklinghausen's disease. Late cases of Paget's disease show metabolic changes the reverse of those found in osteomalacia. Endocrine disturbances may be an etiological factor.—Chem. Abst., **16**, 2911.

The ENDOCRINES and their influence on the skin. Davidson (A.), Calif. State J. M. (San Fran.), 1921, **19**, 248-250.

The author concludes that only those glands developed from the same somatic layer as the skin directly affect it; also, that those glands which originally discharge their secretions into the digestive tract alone afford products that are effective therapeutically when admistered by mouth.—H. W.

The ENDOCRINE ORGANS, and the utilization of their products in pharmacy. Dryerre (H.), Pharm. J. (Lond.), 1922, **108**, 265-266; Chem. & Drug. (Lond.), 1922, **96**, 418.

An address on the functions of the ductless glands of the body.

—Chem. Abst., **16**, 2575.

ENDOCRINE ADIPOSITY. Engelbach (W.), Med. Clin. N. Am. (Phila.), 1922, **6**, 1-29.

An excellent paper dealing with the evaluation of obesity as a diagnostic sign of certain ductless gland disorders. Obesity and undernutrition are not necessarily due to heredity, deficient or excessive exercise, improper feeding, and the like. The evaluation lies not in the amount of food taken, but in the amount stored in the body or catabolized and excreted, which produces the balance in weight. Though the internal secretions play an important part in

the regulation of the rate of metabolic activity, we find that in obesity in patients with uncomplicated **pituitary or gonad** disorder, metabolic determinations vary but little from the normal. With a view to throwing additional light upon the etiology of adiposity in pituitary and gonad insufficiencies, studies of the blood fat are being made, for it is possible that the cause lies in deranged fat metabolism. The basis for the following deductions regarding these endocrinous adiposities is the correlation of the studies made by the author and Dr. John L. Tierney of 1995 cases of disorders of the ductless glands. Two aides were depended upon in diagnosis: (1) the age incidence of the obesity; (2) the localization and distribution of the obesity.

Infantile adiposity or adiposity at birth is seen in **cretinism** and frequently appears in the history of adult **hypothyroid** females. Adiposity, late dentition and late locomotion and speech are sufficient reasons for placing an infant upon treatment for hypothyroidism. Hypothyroid babies do not carry an excessive weight into their early childhood, hence children past three or four with adiposity probably are not hypothyroid, and if hypothyroid, have an added hypopituitarism. Juvenile adiposity (between the fourth and fourteenth year) is due to hypofunction of the posterior lobe of the pituitary. The history of such patients usually reveals a normal birth and development up to the age of 4 or 5. Between this age and adolescence they suddenly take on an unusual adiposity out of proportion with their age and height. Otherwise the patients appear normal, and the mentality is normal, or even precocious. Adult adiposity may be due to disorders of the pituitary, the thyroid or the gonads, or a combination of these. Aside from early castrates and classical eunuchs (in which the adiposity is located over the trochanter area), adiposity due to insufficiency of the gonads rarely occurs before the age of 34 or 35. Thyroid and pituitary adiposity may occur at almost any age, but in cases occurring past 30, of a duration of a year or two, there is a likelihood of a pluriglandular involvement secondary to a uniglandular disorder.

The distribution of the adiposity is of diagnostic value. **Thyroid adiposity** presents the characteristic dorsal hand padding and supraclavicular padding with evenly distributed adiposity. In infants and juveniles the hand and cervical padding may be absent, while in adults it may be transient. **Pituitary** adiposity in childhood and adult life is located about the hip and shoulder girdles. The pelvic girdle adiposity extends from the navel down to the juncture of the middle and lower thirds of the thigh. The shoulder girdle is often most marked over the deltoid region. Considerable adiposity about the lateral aspects of the thorax is likewise seen. Cases with deficiency of the anterior lobe of the pituitary with infantile genitalia may present some mammary adiposity not quite so marked as in primary gonad insufficiency. The forearm, hand, leg, foot, and the

cervical regions are quite free from infiltration. There is comparatively little mons veneris padding excepting in cases of secondary hypogonadism due to anterior pituitary insufficiency. In gonad insufficiency up to the age of 34 or 35, there is complete absence of adiposity, except about the trochanteric regions. In early castrates in both sexes, there is a tendency to overgrowth of the long bones. True gonad obesity begins to appear at 34 or 35, consisting of disproportionate mammary enlargement, an apron of mons veneris, and a fullness of the thighs. Pluriglandular obesity consists of a blending or fusing of a number of these typical adiposities in a single individual. The diagnosis depends largely upon a careful history, with special attention to age incidence, localization and distribution of the adiposity, and the fact that the disorder begins as a uniglandular condition.

Treatment to yield results must be instituted early—when only one gland is affected, with the purpose of stimulating it into normal physiological activity. Failure in treatment is due to late diagnosis and lack of a proper sense of theraptutic indications. In cases diagnosed early, treatment may fail for the following reasons: (1) the digestion of much of the ductless gland preparations in the stomach; (2) insufficient dosage; (3) too long intervals between hypodermic injections; and (4) the administration of an insufficient amount of the active principle of the glands subcutaneously or intravenously. Digestion by the stomach may be avoided by the use of salol-coated or creatinin-coated capsules. With the exception of thyroid preparations, opotherapy per oram is unsatisfactory. Thyroid administration in hypothyroidism should be guided by the temperature, weight, and the pulse rate of the patient. In pituitary deficiency, pituitrin is administered in gradually increasing doses until the "intestinal reaction" is produced; dosage is then continued. If after two or three months of intensive treatment there has been no decided improvement, the case may be considered as not amenable to opotherapy. Cases of gonad insufficiency in the male do not yield to treatment by the various orchic substances, nor do they respond to pineal or pituitary treatment. In female gonad insufficiency, large doses of entire ovarian substance administered 4 or 5 times daily result in improvement. In adiposity due to pluriglandular disorder, the treatment will depend largely upon the judgment of the experienced endocrinologist. Early, prolonged uniglandular treatment in pluriglandular disorders is an aid in estimating therapeutic indications and in helping to fix the diagnosis in complex clinical pictures. In addition to endocrine treatment, the necessary dietetic, hygienic, and hydrotherapeutic measures should be employed.—I. B.

Physiognomy of ENDOCRINOLOGY. Fridenberg (P.), N. York M. J. [etc.], 1922, **115**, 413-415.

A sketchy discussion in which the author transfers the explanation of facial characteristics from the school of phrenology and physiognomy to the newer school of endocrinology.—H. W.

The newer critical phase of ENDOCRINOLOGY (L'endocrinologia nella sua recente fase critica). Frontali (G.), Riv. di clin. pediat. (Firenze), 1919, **21**, 100.

According to Gley an organ can be classified as a gland of internal secretion only when the relation of its secreting elements to the blood stream is established, when the secretion can be chemically determined in the blood, and when the venous blood from the organ has a specific physiological action. An observation of Quinquaud is cited in which the blood of the inferior vena cava was found not to contain **adrenin**, and consequently this substance is to be looked on as an excretion and not as a physiological secretion. Frontali thinks the criticism is too inclusive. For example, it is impossible at present to detect in the blood the products of the **thyroid** gland activity, yet thyroid medication is of established benefit in certain well-known conditions. On the other hand, perhaps it is true that the effectiveness of the thyroid extract is referable to the storage of the active principle in the follicles in noteworthy amounts while this may not be the case in the other glands.—F. S. H.

ENDOCRINOLOGY: The surgical phase. Gatch (W. D.), Proc. Indiana State M. Ass., 1922, Sept. 28-30.

The most important aspect of endocrinology from the standpoint of the surgeon is the uncertain and fragmentary state of our knowledge about it. We must move cautiously. Therefore, in the diagnosis of supposed endocrine disease, or in the operative treatment, we must employ the most rigid criteria of judgment, and not allow theories of endocrine function to influence us, for today the truth of these theories is almost without exception undemonstrated. These conclusions do not dispute the great physiologic importance of the endocrine glands, and should not discourage study of their functions.—J. Am. M. Ass., **79**, 1545-1546.

(ENDOCRINE) A metabolic study of progressive pseudohypertrophic muscular dystrophy and other muscular atrophies. Gibson (R. B.), Martin (F. T.) & Buell (M. V. R.), Arch. Int. Med. (Chicago), 1922, **29**, 82-96.

Seven cases of progressive pseudohypertrophic muscular dystrophy in boys and two adult male cases formed the material for careful metabolic study. One case each of myasthenia gravis, muscular atrophy following acute anterior poliomyelitis, and myositis ossificans were also studied. Endocrine disturbance in progressive pseudohypertrophic muscular dystrophy is indicated by the hereditary character of the condition, the metabolic abnormalities, the

occasional recovery at puberty when glandular readjustments occur, reported improvement following endocrine therapy in some cases, and the development of the disease in polyglandular dystrophies, notably in association with dystrophia adiposogenitalis. Necropsy findings with special reference to ductless glands are urgently needed to elucidate further the pathogenesis of the condition. The authors review the literature covering the metabolic investigations of this disease, and summarize the outstanding features (corroborated by their own investigations) as follows. Those associated with the atrophic condition of the muscles, and which are intensified as the atrophy progresses are lowered creatinin excretion and creatinin coefficient, creatinuria, recovery in the urine of ingested creatin and creatinemia, though high blood creatins are not a constant finding. In disturbances of carbohydrate metabolism of endocrine origin the usual but not constant findings are hypoglycemia and deficient glycogenesis following moderate glucose ingestion, commonly without glycosuria. The differential diagnosis of progressive pseudohypertrophic muscular dystrophy, myasthenia gravis, and progressive muscular atrophy may be checked by the metabolic and blood findings, as indicated in following table:

	Creatinuria	Blood Glucose	Glucose Tolerance
Progressive pseudohypertrophic muscular dystrophy	Present	Low	Diminished
Myasthenia	Absent	Low or normal	Diminished
Progressive muscular atrophy	Present	Normal	Normal

—H. L.

ENDOCRINE types of dysmenorrhea. Godbey, West Virg. M. J. (Huntington), 1921, **17**, 108.

Endocrine factors play an important part in menstrual life. The **hypothyroid** girl is small and menstruates very early and there is prolonged menstruation. There is an overdevelopment of the mammary glands and abundant growth of body hair at an early age. In **hyperthyroidism** the reverse of the above is true, with much dysmenorrhea. This is the eunuchoid type. The ovarian type comes on after menstruation is established. The pains during menstruation are marked and there may be a characteristic pain in the region of the appendix. **Ovarian** feeding, with hypodermics of **pituitrin**, gives good results. The pituitary type is more easily diagnosed and if treated early does well on pituitary compounds and other endocrine substances.—Am. J. Obst. & Gynec., **4**, 205-206.

Our problems in ENDOCRINOLOGY. Gutman (J.), N. York M. J. [etc.], 1922, **115**, 415-418.

A cursory discussion of the present position of endocrinology among the medical sciences.—H. W.

Hypersensitiveness of the skin to x-rays, especially in ENDOCRINE disturbances (Ueber die Röntgen hypersensibilität der Haut, be-

sonders bei innersekretonischen Störungen). Haas (L.), Deutsche med. Wchnschr. (Berl.), 1922, **48,** 1134-1136.

It was already known that especially in psoriasis, **Graves' disease** and eczematoid seborrhea there is an increased sensitiveness to x-rays. Haas has found this same irritability in pruritus and secondary chronic lichen simplex. This is probably due to an endocrine dysfunction. Therefore, extreme care is necessary in the dosage of x-rays in treating endocrinopathies.—J. K.

Remarks on the ENDOCRINE system. Hutton (J. H.), Illinois M. J., 1920, **38,** 505-509.

The **adrenals, pituitary** and **thyroid,** are (to judge by tinctorial reactions) functionally united, forming the chromaffin system. The function of the adrenals is to sustain pulmonary and tissue respiration and they are responsible for the chloasma of pregnancy. Of hyperactivity of the cortex alone the stigmata are overgrowth of hair, and marked muscular development and obesity in males, while a child may attain the size and characteristics of an adult. The anterior lobe of the pituitary has to do with the growth of the skeleton, conditioning dwarfism, gigantism and acromegaly; the development of the genitalia and secondary sex characteristics; the size, shape, and arrangement of the teeth; and the amount and distribution of the hair. The posterior lobe presides over metabolism, carbohydrate tolerance, adiposity, polyuria, and involuntary muscle contraction. Hypothyroidism causes subnormal temperature; cold extremities; myxedematous or dry, doughy, scaly skin; dry, brittle hair and nails; and mental deficiency. Thyroid extract in small doses especially in hypothyroidism results in a rise in temperature, enhanced metabolism, and marked improvement in general nutrition and strength. Thyroid preparations are valuable in diseases due to slowed destruction of toxic wastes, in lowered general nutrition of all tissues, and in all cases in which the process of repair and absorption are deficient—as in delayed union of fracture. The function of the **parathyroids** is to neutralize toxic substances formed elsewhere in the body. They are concerned with the regulation of metabolism of the guanidin compounds in the body. The **thymus** and the **pineal** body are glands which should atrophy at puberty. If they cease functioning before, precocious puberty results; if they persist after, **infantilism** and sex reversion result. The thymus supplies the excess of phosphorus in organic combination needed for development and growth. It produces nucleins until the bone marrow and the lymphatic glands can take up the work. The thyroid, parathyroids, adrenals, and pituitary have been mentioned as forming the immunizing mechanism of the body. The pituitary, thyroid, and **ovaries** are closely allied. At the menopause the cessation of the ovarian function is apt to be accompanied by a diminution of function in the thyroid and pituitary. Disorders of the menopause

not relieved by ovarian therapy are benefited by the addition of pituitary and thyroid extract. Vagatonia and sympathicotonia are discussed. Vagatonia is associated with the disturbances of some endocrine gland or glands, especially the thymus and thyroid.

—Author's Abst. (abbreviated).

Some ENDOCRINE aspects of the psyche. Hammar (J. A.), Folia neuro-biol. (Leipz.), 1921, **12**, 209-230.

A paper which aims to point out that the psychical processes are to some extent dependent on the reaction of the nervous elements to chemical influences, and that the products of the activity of the glands of internal secretion being chemical in nature are known to have an effect upon the nervous reactions of the organism.

—F. S. H.

ENDOCRINES in children. Harper (W. W.), South. M. J. (Birmingham), 1922, **15**, 536-540.

General review of the pathology of the endocrine glands in children.—F. S. H.

The ENDOCRINES and their relation to future medicine. Holmes (P. K.), Kentucky M. J. (Bowling Green), 1922, **20**, 567-570.

A general paper pointing out the important relation of the endocrine glands to the future of medicine.—H. W.

Some principles of endocrinology applicable to ORGANOTHERAPY. Hoskins (R. G.), J. Am. M. Ass. (Chicago), 1922, **79**, 104-106.

Endocrinology, says Hoskins, is, to an unusual degree, an empiric field. Much of the existing confusion in the endocrine field would appear to be due to overanxiety to escape the reproach of empiricism—to force rationalization when no genuine rationalization is possible. It is asserted that endocrinology in some form is going to flourish indefinitely. Parlor endocrinology is even displacing parlor Freudism. For better or for worse, endocrinology has acquired a recognized place in the field of medicine. For two decades practitioners have been avidly seeking enlightenment regarding the practical, everyday problems with which they are confronted. As to how their needs have been met, let the present state of organotherapy testify. So long as the well trained leaders fail to lead, just so long will cheap, commercialized endocrinology have a large following, and medicine be cheapened to the same degree.

—Courtesy Am. M. Ass.

The psyche and the vegetative nervous system with special reference to some ENDOCRINOPATHIES. Jelliffe (S. E.), N. York M. J. [etc.], 1922, **115**, 382-387.

Primarily the paper is a discussion of the influence of the psyche on endocrine disturbances. The basis of the paper consists of a case history of a young woman who showed signs of mild exophthalmic goiter. A psychoanalysis revealed a deep seated sex complex.—H. W.

ENDOCRINE GLANDS. Nanism and infantilism (Glandes endocrines. Nanisme et infantilisme). Lereboullet (M.), Progrès méd. (Par.), 1922, **37**, 233-236.

One of a course of lectures. No new data.—F. S. H.

Changes in the calcium of the blood in otosclerosis and its relation to the ENDOCRINE ORGANS (Blutkalkveränderungen bei Otoskierose und ihre Beziehungen zur Störungen der inneren Sekretion). Leicher, Deutsche med. Wchnschr. (Berl.), 1922, **48**, 1090.

In 75% of the cases of otosclerosis there was a marked decrease of the amount of calcium in the serum. This low calcium content is due to endocrine disturbances. Hyperfunction of the **thyroid, hypophysis** and **adrenals** decreases the quantity of calcium; hypofunction of these organs increases the calcium of the blood. The **parathyroids** have the opposite influence, while the **gonads** seem to have no influence.—J. K.

(ENDOCRINE GLANDS) Obesity. The infantile dystrophies and the periglandular syndromes in the child (L'obesité. Les dystrophies infantiles et les syndromes périglandulaires chez l'enfant). Lereboullet (M.), Progrès méd. (Par.), 1922, **37**, 285-288.

One of a series of lectures. Generalized discussion.—F. S. H.

(ENDOCRINE) On the structure and development of a fat body or gland in the rat. Long (J. A.), Anat. Record, 1922, **23**, 107.

A lobed or branched fat body located in a depression of the muscles between the scapulae is described. It is darker in color than ordinary fat. The contained lipoid is a neutral fat which stains red in nile-blue-sulphate. It appears in the embryo of 17 days, increases rapidly in size and at birth is relatively large. The whole structure reminds one of an organ of internal secretion such as a **corpus luteum**.—W. J. A.

(ENDOCRINE) Findings in a case of myotonia dystrophica (Untersuchungsbefund an einem Fall von Dystrophia myotonica). Maas (O.) & Zondek (H.), Ztschr. f. d. ges. Neurol. u. Psychiat. (Berl. u. Leipz.), 1920, **59**, 322.

The case described was somewhat atypical. A significant testicular atrophy was lacking. There was polyuria and pigmentation. The upper arm musculature was atrophic. Response to faradic stimulation was sluggish and delayed. The participation of the

hypophysis, adrenals and **thyroid** in the final syndrome was evident from the particular landmarks given by the general picture.—F. S. H

(ENDOCRINE GLANDS) The pathogenesis of deficiency disease. VIII. The general effects of deficient dietaries on monkeys. McCarrison (R.), Indian J. M. Research (Calcutta), 1919, **7**, 308-345.

The summary of the results of these extensive investigations is as follows. Monkeys fed exclusively on rice, autoclaved at a temperature of 130° for one and a half hours, died on an average within 23.4 days. Monkeys fed on this diet plus butter died in 15 days. The total loss of weight ranged from 25% to 32% of the original weight. The chief clinical evidences were anemia and asthenia, anorexia, diarrhea, weakness of limbs, subnormal temperature and weak cardic action. Symptoms referable to the nervous system were less prevalent. All classes of deficient dietaries caused an increase in the **adrenals** and sometimes adrenalin was increased. The weight of the **pituitary** was also increased by the deficient dietaries. The pituitary was heavier in the females than in the males. Atrophy of the **thyroid, reproductive organs, pancreas, spleen** and **liver** occurred.—F. S. H.

ENDOCRINOLOGY: The medical phase. McCaskey (G. W.), Proc. Indiana State M. Ass., 1922, Sept., 28-30.

A large group of cases can be differentiated only by utilizing all the facts concerning endocrinology, and by availing ourselves of the special diagnostic methods which have been developed within the last few years, especially basal metabolism and carbohydrate tolerance. In many cases of endocrine disease there is a perfectly normal basal metabolism. An increase or decrease in carbohydrate tolerance of a given case has an important bearing on diagnostic questions. Frequently the presence or absence of one or two symptoms will point toward the existence of hyperfunction, or hypofunction or dysfunction. It has often happened in my experience that the existence of tuberculosis or endocrine disease as the principal factor in the causation of a given syndrome could be decided in that way. Organotherapy is far from being the only therapeutic deduction derived from a positive diagnosis of endocrine disease. In fact, I feel called on to express a warning, if not a protest, against the indiscriminate exploitation of organic products by commercial interests. In therapeutics, as well as in diagnosis, the endocrine glands have come to the front to stay, but the number of these products that have a proved scientific basis is very small, and their use requires the most painstaking discrimination in order that the patient may not suffer from commercial venders, on the one hand, and unscientific medical practice on the other.

—J. Am. M. Ass., **79**, 1545.

INTERNAL SECRETIONS and retarded consolidation of fractures (Le secrezioni interne e il retardo di consolidazione delle frature). Marsiglia (G.), Arch. ital. di chir., 1922, **5**, 197.

The author sums up previous work on the subject thus: Various researches on different glands all relate to young animals still developing; **thyroidectomy**, it is agreed, produces some delay in consolidation; **thymectomy**, not only delay, but actual defect; **parathyroidectomy**, even partial, according to some, leads to delay, whilst others observe no effect; removal of the **suprarenals**, unless bilateral and therefore incompatible with life, exerts no influence on repair; oöphorectomy slightly accelerates callus formation. Marsiglia has repeated the experiments on adult dogs, fracturing a leg two or three days after the ablation of the gland, and using controls. Thyroidectomy, partial or complete, causes no delay, though in some cases there seemed to be rather a large mass of callus which was absorbed but slowly; the osteoid phase lasted longer than in the controls. Parathyroidectomy he found technically impracticable. Unilateral suprarenal removal produced no effect; uni- or bi-lateral oöphorectomy had no influence. Complete removal of the **pituitary** in dogs the author found impracticable by any route, but by the external orbital approach, using a calibrated instrument, he was able to pulp the gland in such fashion that at the post-mortem 40 days later the tissue was found necrotic. Repair of the fractures was unaffected. Histological examination of all the fractures revealed nothing for remark. It is probable, therefore, that there is no one gland, even in man, that has any effect on the course of callus formation, or on the causation of non-union or pseudarthrosis; or that the administration of extracts of one or more of the endocrine glands will have any value, at any rate in the adult.

—Med. Sc., 1922, **6**, 383.

(ENDOCRINE) Aids to basal metabolic rate determinations. Newcomer (H. S.), Arch. Int. Med. (Chicago), 1922, **29**, 748-762.

This paper contains charts and tables so arranged as to facilitate considerably the otherwise laborious calculation of basal metabolism values. (Of technical rather than endocrine interest).—H. L.

Miscroscopic studies of the ENDOCRINE GLANDS in two cases of ichthyosis (Récherches microscopiques sur les glandes endocrines dans deux cas d'ichtyose). Parhon (C. J.), Bull. et mém. Soc. neurol., psychiat. & psychol. de Jassy, 1921, **2**, 88-93.

Description given in brief of the histological appearance of the **thyroid, parathyroids, hypophysis, adrenals, ovaries** and **pancreas.**

—F. S. H.

(ENDOCRINE) The clinical value of basal metabolism determination. Pickard (R. J.), J. Lab. & Clin. M. (St. Louis), 1922, **7**, 669-680.

A practical review of the literature on the diagnostic value of the basal metabolism test, with reports of illustrative cases and notes on technic. Of value chiefly to the laboratory technician.
—I. B.

(ENDOCRINE) Maladie pigmentaire. Pinard (M.), Bull. et mém. Soc. méd. d. hôp. de. Par., 1922, **46**, 1009-1012.

Case of pigmentation in which no signs of **diabetes** or cirrhosis were present.—F. S. H.

(ENDOCRINE) Etiology of 150 cases of bronchial asthma. Piness (G.), Calif. State J. M. (San Fran.), 1921, **19**, 29-33.

Of the 150 cases studied 4, or 2.6 per cent, showed signs of endocrine disturbance; one **hypothyroidism**, two **hypopituitary** and one **ovarian** dysfunction. The latter patient, 18 years of age, was sensitive to dog hair. Asthmatic attacks preceded by several days the establishment of menstruation. Treatment with dog hair did not give relief; however, when 5 grains of **corpus luteum** three times a day were given along with the dog hair she obtained rapid relief and remained free from attacks for 8 months.—H. W.

ENDOCRINODONTIA. Pollina (V. J.), Dental Cosmos (Phila.), 1922, **64**, 218-233.

The author believes that the incretory organs play an important rôle in dental health and disease. His conceptions of endocrine interrelations and therapeutic indications are set forth in elaborate charts.—R. G. H.

An address on the DUCTLESS GLANDS. Rennie (G. E.), Med. J. Australia (Sydney), 1920, **2**, 93-101.

A general review.—F. S. H.

Effect of alcoholism upon the ENDOCRINES. Sajous, Med. World (Phila.), 1922, **100**, 280.

Sajous says that alcohol in stimulating but non-toxic doses increases the functional activity of the incretory organs, especially **adrenals** and **thyroid**, through which it increases the cardio-vascular tone, the respiratory activity, the rate of metabolism, and the efficiency of the defensive functions. It increases general metabolism (1) by becoming oxidized itself, and thus increasing the heat energy liberated in the blood and tissues; (2) by stimulating the adrenals, which govern the intake of oxygen and sustains catabolism. In toxic doses the excess of alcohol becomes oxidized at the expense of the oxygen in the blood. The tissues, including the endocrine, being inadequately supplied with oxygen, their metabolic rate is slowed, the cardio-vascular tone is lowered and the defensive efficiency of the body is reduced, giving rise in marked cases to the

symptomatology of acute alcoholism. Sajous considers that liquids containing 3 per cent by volume of alcohol are non-toxic and in moderate doses are therapeutically of great value as stimulants of adrenal function.—Prescriber, **16**, 278-279.

The ENDOCRINES in otology. Sajous (C. E. de M.), Laryngoscope (St. Louis), 1921, **31**, 659-672.

A review of previously enunciated principles of internal secretory activity and their relation to medicine generally and otology specifically.—H. W.

(ENDOCRINE GLANDS) Remarks on the vermiform appendix considered as an active gland in its relations with other glands and with appendicitis (Quelques remarques sur l'appendice caecal, envisagé comme glande active, dans ses rapports avec d'autres glandes et avec l'appendicite). Savini (E.), Progrès méd. (Par.), 1920, **35**, 390-391.

A speculation which is not based on direct observation or experimental data.—F. S. H.

The ENDOCRINES in the treatment of premature old age. Scott (T. B.), N. York M. J. [etc.], 1922, **115**, 431-433.

Deficiency of thyroxin such as seen in **myxedema** and senile decay is associated with the continuously raised blood pressure while a fully active **thyroid** is associated with a low or normal pressure. Hypertension of premature senility may be successfully treated with thyroid preparations. If the heart becomes disturbed on this treatment the administration of **suprarenal extract** will remove the disturbance and permit a good thyroid result. Suprarenal extract very rarely raises the blood pressure above normal; it will certainly raise a subnormal pressure to normal. Anterior **pituitary extracts** should be used in the treatment of impotency of old age. Thyroid and anterior pituitary extracts are indicated in general senile debility. The same extracts may give good results in the treatment of senile epilepsy.—H. W.

(ENDOCRINOLOGY) Disturbances of metabolism and its relation to certain disorders of the respiratory tract. A preliminary report. Selfridge (G.), Laryngoscope (St. Louis), 1922, **32**, 243-258.

Review of the relation of metabolism to endocrinology in respiratory disorders; preliminary report.—H. W.

Melanodermias of ENDOCRINE origin (Les mélanodermies d'origine endocrinienne). Sézary (A.), J. méd. franç. (Par.), 1920, **10** (November).

Inasmuch as there are to be found cases of melanodermia which fail to exhibit syndromes of **adrenal** involvement, Sézary believes

that the disorder is to be traced to the functional disturbance of various organs, all of which have the characteristic in common with the adrenals of elaborating an internal secretion. In support of this belief there is adduced the well-known melanodermia which may accompany disturbances of liver function, the pigmentation of Basedow's disease, or of hypophyseal origin, and the pigmentation occurring at puberty and the menopause. After discussing the possible theories in connection with the phenomenon in general the conclusion is drawn that when an external cause of cutaneous pigmentation is absent, or when a well-defined internal etiology is lacking, such a condition points to a disorder of endocrine origin which should be sought for with care.—F. S. H.

Influence of the ENDOCRINE GLANDS on the liability to convulsions (Einflusz endokriner Drüsen auf Krampffähigkeit). Specht, Wien. klin. Wchnschr., 1922, **35**, 664.

Data reported elsewhere. (See Endocrin., **6**, 130.)—J. K.

The influence of the external temperature on BLOOD SUGAR content (Beiträge zur Kenntniss des Einflusses der Aussentemperature auf den Blutzuckergehalt). Taya (M.), J. Biochem. (Tokyo), 1922, **1**, 479-509.

The normal blood sugar concentration is almost the same in summer and winter, hence season has no effect. An increase in external temperature induces an increase in blood sugar which reaches its maximum in 2 to 4 hours and then returns to the normal. On cooling the animal venous blood is found to contain less sugar than carotid blood. The recovery is delayed under these conditions.—F. S. H.

Effect of general excitement and of fighting on some DUCTLESS GLANDS of male albino rats. Uno (T.), Am. J. Physiol. (Balt.), 1922, **61**, 203-213.

Hatai and Hammett (Am. J. Physiol., 1920, **53**, 312) have shown that the excitement induced by rough handling causes a modification of the reaction of the rat's intestine to sodium carbonate, and the author has made an investigation of some of the endocrine glands under such excitement, in the hope of locating the cause of the phenomenon. Forty-one pairs of male rats were used; each pair was from the same litter and carefully controlled as to diet. They were stimulated to fight by being placed in a wire cage with a wooden bottom, through which projected the blunt ends of wire nails connected with a battery of dry cells. After from one to six hours the weight, water content, and action of the extracts of the hypophysis, thyroid and adrenals was determined. The results for the thyroid and adrenals were entirely negative. The results for the hypophysis were positive. The gland increased in weight, but

not in water content. The extracts caused contraction of the intestinal strip, while the control caused relaxation, the usual reaction. The modification appeared about one hour after excitation.—T. C. B.

(INTERNAL SECRETIONS) On the influence of visceral extracts, body juices and the dilute solutions of metallic salts on the maintenance of life of the spermatozoa. Uramato (S.), Jap. Med. World (Tokyo), 1921, **1**, 18. Author's abstract from Nisshin Igaku, 1921, **10**, No. 8.

Cerebrospinal fluid, aqueous humor and **uterine** extract of the rabbit, extracts of the liver, **testicles** and lymphatic glands of the albino rat are more adapted for the preservation of the life functions of the spermatazoa of albino rats which have been taken out of the body than is physiological salt solution. The preservation of the life of the spermatozoa of albino rats in the extracts of the brain, **hypophysis,** senimal vesicle, prostate, **adrenal** capsule, salivary glands, **spleen,** lung uterus and vagina, **ovaries** and fallopian tubes of albino rats and the peritoneal juice of the rabbit are as effective as is physiological salt solution. The bile of the rabbit, the serum of rabbit and rat, the lymph of the rabbit, the extracts of the stomach, intestines and the muscles of albino rats are inferior. —F. S. H.

Importance of INTERNAL SECRETIONS in etiology of impetigo herpetiformis. Walter (F.), Ploska Gaz. Lekarska (Cracow, Lodz, Lwow, Vilna, Warsaw), 1922, **1**, 425-427.

Reference cited from J. Am. M. Ass., **79**, 1188.

The GASTRIN theory put to physiological test. Ivy (A. C.) & Whitlow (J. E.), Am. J. Physiol. (Balt.), 1922, **60**, 578-588.

A "two gastric pouch" was made in order to test the "gastrin theory" which maintains that substances in contact with the mucosa of the pyloric antrum cause the formation of gastrin which is absorbed and stimulates the glands of the fundic mucosa. The authors failed to obtain an increase of secretion in the Pawlow pouch when various substances were applied to the mucosa of the pyloric pouch. The work of Edkins and Tweedy was repeated, and demonstrated an inadequate control of their experiments.—T. C. B.

(GONADS) An atypical formation from the follicular elements in an OVARY transplanted into the dog (Sur une formation atypique constitueé aux dépens des éléments folliculaires dans un ovaire transplanté chez la chienne). Athias (M.), Compt. rend. l'Ass. d. anat. (Par.), 1921, May, 21-23.

An autotransplanted ovary enlarged considerably. On removal at autopsy numerous cysts were found. The genital tract was normally developed. Histological study of the implant showed ova in

various stages of development. A peculiar cellular arrangement in connection with one of the follicles is described.—F. S. H.

(GONADS) Effects of castration on the automaticity of the uterus of the guinea-pig (Effets de la castration sur les mouvements automatiques de l'utérus chez le cobaye). Athias (M.), J. de Physiol. et de path. gén. (Par.), 1919, **18**, 731-743.

The uterine muscle possesses both clonic and tonic functions. When guinea-pigs are castrated the motility of the uterus is markedly modified in that there is a gradual weakening of the intensity of the automatic contractions up to the point of their complete cessation while the tonicity function remains, and even at times appears to be a bit enhanced. These changes are attributed to the suppression of the internal secretion of the ovary. They are not found in animals in which ovarian implants have been made after ovariectomy.—F. S. H.

(GONADS) The interstitial cells of the OVARY of Cheiroptera (Récherches sur les cellules interstiticlles de l'ovairs des Cheiroptères). Athias (M.), Arch. de Biol., 1919, **30**, 89-212.

An extensive histological study with bibliography. The interstitial cells reach their maximum development during the periods of pregnancy and lactation. In the autumn a regression occurs, while towards the middle of the winter an increase begins. The interstitial cells resemble those of other mammals and show the characters of glandular elements. In young aminals the source of the cells is largely the connective tissue of the ovarian stroma. Later the theca interna of the atretic follicles is the principal source. —F. S. H.

(GONADS) Two cases of INFANTILISM with mental infirmities (Deux cas d'infantilisme avec infirmités mentales). Ballif (L.), Bull et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 57-66.

Ballif is inclined towards the pluriglandular hypothesis of the etiology of infantilism. The cases, which present no unusual features, are described, but record of treatment is not given.—F. S. H.

(GONADS) Case of essential gynecomastia (Un cas de gynecomastie essentielle). Ballif (L.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 158-160.

The right breast was enlarged. Testicular traumatism or genital infection was not reported and there was no pain.—F. S. H.

(GONADS) The production of liquid of the seminal vesicles in relation to the internal secretion of the TESTICLES (La production du liquide des vésicules séminales en rapport avec la sécrétion

interne des testicules). Battelli (F.) & Martin (J.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 429-431.

The development and the secretory functions of the vesiculae seminales are dependent upon the internal secretion of the testicles. Castration causes atrophy of the vesiculae with cessation of the vesicular liquid. We can thus observe the quantities of liquid produced in a given time, and follow the modifications of the hormonic activity of the testicles. We can obtain a complete ejaculation at will by the method of Battelli. In order to have comparable results, all the guinea pigs were subjected to one ejaculation a week, made under the same conditions. Individual differences are considerable. There are variations with the season, the quantity of vesicular fluid being greatest in the spring. There is no notable difference due to temperature. Frequency of ejaculation and ligature of the vas deferens cause diminution of the vesicular fluid. Injection of testicular extracts is without effect in restoring the secretion.—T. C. B.

(GONADS) Ovarian transplantation (A propos des greffes ovariennes). Bazy (P.), Bull. Acad. de méd. (Par.), 1921, **86**, 106; abst., Rev. franç. de gynéc. et d'obst. (Par.), 1922, **17**, 41.

In discussing the report of Tuffier (q. v.), Bazy expresses skepticism as to the value of ovarian grafting. The results of Tuffier, he states, are only temporary when they are not absolutely nil. Opotherapy will accomplish just as much in preventing ablation symptoms.—E. N.

(GONADS) A case of androgynous pseudo-hermaphroditism with an intra-abdominal tumour following the removal of a rudimentary genital gland. Rapid disappearance of this tumour under radiotherapy (Un cas de pseudo-hermaphroditisme androgyne avec tumeur intra-abdominale consécutive à l'ablation d'un rudiment de glande génitale. Disparition rapide de cette tumeur sous l'influence de la radiothérapie). Béclère & Siredey, J. de radiol. et d'électrol. (Par.), 1921, **5**, 211.

The authors describe the clinical features of a case of a woman of 54, who had an abdominal tumour which appeared to be a large bossy tumour of the **spleen.** Some points about the case resembled that of a porter seen nine years previously by Béclère, in which the tumour followed on the removal of a neoplasm of the left **testicle.** Two important facts were observed in the present case. (1) A cystic tumour had been removed from the left inguinal region four years previously. (2) The patient had never menstruated. From a clinical examination it appeared that the case was one of androgynous pseudo-hermaphroditism; the external genital organs and the breasts were female in type, and a small mass under the skin at the upper part of the right labium magus immediately below the external

inguinal ring was looked upon as a rudimentary testicle. The cystic tumour previously removed from the left side had not been microscoped, but a description by the surgeon strengthened the belief that the mass on the right side was a rudimentary testicle. The inguinal tumour and the large splenic tumour were regarded as cause and effect, and, since operation was refused, radiotherapy was the only available treatment; treatment lasted about five months and comprised twenty séances, weekly at first and then at longer intervals. A description is given of the method of applying the rays The results obtained were very good and rapid; ten days after the first séance the tumour was distinctly smaller and the pain caused by it considerably less. Six weeks from the beginning of treatment radioscopic examination of the abdomen showed nothing abnormal; a month later the patient had no pain and the spleen was palpated with difficulty. Irradiation was continued as a precaution against recurrence. Later the patient put on weight, but she complained that brain-work was more difficult and tiring than formerly. The latter part of the paper is taken up by an account of the case treated some years previously by Béclère.—Med. Sc., **5**, 546-547.

(GONADS) The energy requirements of girls from 12 to 17 years of age. Benedict (F. G.) & Hendry (M. F.), Boston M. & S. J., 1921, **184**, 217-222; 257-262; 282-286; 297-306; 329-334.

Basal metabolism was studied in a group of girls ranging from 13 to 17 years of age. No influence of puberty or the prepubescent stage was clearly proved in any of the results.—H. W.

(GONADS) An apparantly hopeless case of polyglandular disturbance with infantile genitalia in a boy of 17½ years: complete cure at 21 years. Boynton (C. E.), South. M. J. (Birmingham), 1922, **15**, 619-620.

Case report. The patient showed delayed sexual development, with general body form of the female type. The psyche was that of a normal boy. The only glandular defect noted was an underdevelopment of both **testes**, which were in their normal position. Treatment by feeding extracts of **pituitary, thyroid** and **thymus**, as well as "didymin," at different times had no effect. The case yielded to mechanical treatment.—J. C. D.

(GONADS) After results of removal of uterine appendages in hysterectomy for uterine fibroids and chronic metritis. Bride (J. W.), J. Obst. & Gynæc. Brit. Emp. (Lond.), 1922, **29**, 68-87.

As a result of a questionnaire study of 231 patients, Bride arrives at the following conclusions. The general health of nearly all the patients after both operations is much better, but a larger percentage are better after the radical operation. The temperature of the patients is adversely affected in only a small percentage after

either operation, but after the conservative procedure this percentage is slightly larger. Flushings occur in a large percentage of patients after either operation. The percentage is slightly greater after the radical operation. A very small percentage of patients complain of nervous symptoms after operation, but the percentage is larger after the conservative operation. A very small percentage of women after either operation complain of more pain, but after the conservative operation it is more than twice the percentage of that after the radical operation. A larger percentage of women have disturbances of their sexual relations after the radical than after the conservative operation in the proportion of 39 to 26 per cent. There is a greater tendency to adiposity when both ovaries are removed. In brief, then, so far as the majority of the manifestations of the artificial menopause are concerned, there is very little to choose between the two types of operation. The advantage lies with the radical operation in every way save two. The two exceptions are the occurrence of flushes and the sexual disability.
—E. N.

(GONADS) The changes in the white cell picture of the blood during the MENSTRUAL cycle (Ueber das Verhalten des weissen Blutbildes während des menstruellen Zyklus). Caminer (L.), Zentralbl. f. Gynäk. (Leipz.), 1921, **45**, 1601-1604.

The changes in white cell relationships in the normal menstruating woman follow a certain course specific for the individual although the relation of the white cell picture and ovarian activity during the menstrual cycle shows no general regularity. In amenorrhea the variations in white cells are greater than in menstruation, the total leucocytes are low, and the general relationships are not altered when ovarian substance is fed.—F. S. H.

(GONADS) Delayed hereditary lues: endocrinopathies, dystrophias in man of genital origin (Lues hereditaria tardia: endocrinopatias, distrofias de origen genital en el hombre). Castex (M. R.) & Waldorp (C. P.), Prensa méd. argentina (Buenos Aires), 1921, **7**, No. 30.

A clinical and pathological case report. The author attributes the infantilism to hereditary syphilis stimulated to activity by anhylostomiatic toxines.—B. A. H.

(GONADS) Operative attempts at organic rejuvenescence and the therapeutics of genital gland dystrophy (Os ensaios operatorios de rejuvenescimento organico e a therapeutica da dystrophia genito-glandular). Castro (A. de), An. Fac. de Méd. (Montevideo, Uruguay), 1921, **6**, 233-254.

Brief descriptions are given of 3 cases of genital dystrophy in which evidences of hypophyseal enlargement were absent. A good review of the operation and principles of Steinach is given.—F. S. H.

Inoculation of vaccinal pulp into the TESTICLE of the rabbit (Sur l'inoculation de pulpe vaccinale dans le testicule du lapin). Condrea (P.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 895-896.

Not of endocrine interest.—T. C. B.

(GONADS) Climacteric hypertension. Cummings (R.), Calif. State J. M. (San Fran.), 1921, **19**, 116-119.

The author concludes from a study of 158 women in whom the systolic blood pressure was greater than 160 mm. that there are a few cases in which an endocrine disturbance is the possible and entire cause of the hypertension. There are a great number, however, in whom this disturbance is only a minor factor; other factors, such as foci of infection, chronic constipation, fatigue, **thyroidism** and nephritis are the great factors in the etiology. The administration of thyroid and **corpus luteum** extracts give excellent results in those cases of hypertension due to an endocrine disturbance; however, their unaided use is of no particular avail in those with hypertension from other causes.—H. W.

(GONADS) Vasomotor reactions of the penis. Crawford (A. C.) & George (J. M.), J. Urol. (Balt.), 1921, **5**, 89-118.

Plethysmographic curves of the penis and of the hind leg were taken in the dog. The penis volume was increased by drugs which caused limb dilatation, and also by orchitic extract.

—Physiol. Abst., **6**, 276.

(GONADS) Dysovaire. Dalché (P.), Gynécologie (Par.), 1922, **21**, 385-420.

Dysovarianism is a disturbance of the ovarian function. A massive review of the various manifestations of the disorders emanating from such conditions is given.—F. S. H.

(GONADS) Reversive secondary sex phenomena. Draper (G.), Med. Clin. N. Am. (Phila.), 1921, **4**, 1345-1374.

A generalized presentation of 3 male and 2 female patients exhibiting reversive secondary sex phenomena. No attempt has been made to elaborate hypothetical explanations. The cases are offered as typical examples of those endocrinopathic states which are perhaps most definitely established.—F. S. H.

(GONADS) On the relations between fertility and nutrition. II. The OVULATION rhythm in the rat on inadequate nutritional regimes. Evans (H. M.) & Bishop (K. S.), J. Metab. Research (Morristown), 1922, **1**, 335-356.

The effects of defective nutrition are summarized. A standard diet, consisting of whole wheat 67.5, casein 15, whole milk powder 10, sodium chloride 1, calcium carbonate 1.5 and butterfat 5 parts

was given to a number of animals in which the growth and reproductive rates were studied for controls. Several hundred rats were employed in the study. The standard diet was then modified in various ways and the effects on fertility observed. The effects of the following deficiencies of diet were studied with different groups of animals: (1) undernutrition with a balanced diet, (2) changes in the proportions of carbohydrate, fat and protein, (3) qualitative deficiency of the protein, (4) deficiency in salts, (5) reduction in the supply of fat soluble vitamine A, (6) reduction in the supply of water soluble vitamine B, (7) diets consisting of single, natural foodstuffs, and (8) on supposedly adequate diets. It was found that underfeeding caused a disturbance in the ovulation rhythm roughly paralleling the degree of suppression of oestrus and the delay in maturing. Withdrawal of carbohydrate from the diet in itself had no deleterious influence on ovulation. Deficiency of fat in the diet caused an outspoken impairment of the sex function entirely out of proportion to the effect on growth. Inadequacy in the quality of protein in the diet led to a definite subnormality in sex function. Salt deficiency caused sex impairment much in excess of the stunting of growth. Fat soluble vitamine A deficiency in the diet caused a characteristic disturbance of oestrus, resembling no other nutritive disorder, and consisting in prolongation of the oestrus desquamative change in the vaginal epithelium. This is pointed out as being the most delicate test of this particular dietary deficiency. Deficiency in water soluble B caused a complete obliteration of oestrus. Finally, it is shown that certain standard diets which have been employed in some classic investigations on nutrition are deficient when tested as to their effects on fertility. Fecundity and fertility are reduced before the ovulation rate is disturbed and the latter condition indicates a grave impairment.—I. M.

(GONADS) Results of a Steinach operation (Resultado de uma operação de Steinach). Falk (F.), Arch. Rio-Grandenses de med. (Porto Alegre, Brazil), 1922, **3**, 108-109.

A patient of 61 years, after having been treated for urethral stricture, requested Steinach's operation for impotency of 5 years duration. The request was granted and the epididymal ligation close to the **testis** performed. The patient's report of the results are given in his own words and from their context "all lived happily thereafter." Falk, himself, merely reports the case as an interesting incident.—F. S. H.

(GONADS) A case of OVARIAN pregnancy. Fallon (M. F.), Boston M. & S. J., 1921, **184**, 144-150.

Symptoms are the same as in tubal pregnancy. Microscopic examination showed pregnancy in the **corpus luteum.**—H. W.

(GONADS) The endocrine function of the female sexual organs (Weitere Beiträge zur Lehre von der inneren Sekretion der weiblichen Sexualorgane). Fellner (O.), Klin. Wchnschr. (Berl.), 1922, **1**, 1760.

Fellner's "sexuallipoid" (see Endocrin., 1921, **5**, 268) is found in **corpus luteum, placenta** and **testicle.** Mice that have been injected with this substance are less susceptible to cancer and inoculated tumors grow much more slowly than in controls.—J. K.

(GONADS) Remarks on the article of Herrmann and Stein: "Are the active substances of CORPUS LUTEUM and PLACENTA specific for sex?" (Bemerkungen zu dem Aufsatze von Herrmann und Stein. "Ist die aus Corpus luteum bzw. Placenta hergestellte wirksame Substanz geschlechtsspezifisch?"). Fellner (O. O.), Zentralbl. f. Gynäk. (Leipz.), 1921, **45**, 568-569.

Controversial concerning priority.—F. S. H.

(GONADS) Some observations of secondary sex characters (Einige Beobachtungen über die sekundären Geschlechtscharaktere). Gigon (A.), Schweiz. med. Wchnschr. (Basel), 1922, **52**, 316-318.

A brief description of a few characteristic cases of secondary sexual abnormalities. From an extensive study of such phenomena Gigon concludes that there is no single secondary landmark which is a final attribute of the sex. From this it appears that the same organ or part of the human body which exhibits secondary sexual signs is not to be considered as such alone, but rather to be considered as fundamentally from a common origin in both sexes. A wide divergency in the development of the secondary sexual characters may occur; for instance, well developed mammae and faulty hairiness. Atypical hair distribution in sexually normal persons is more frequent than is commonly believed. This dissociation is of practical importance. For example, a man with hypothyroidism but with normal pubic hair and no axillary hair does not belong in the class of the pure hypothyroid cases. The secondary sexual characters are in a great degree independent of the sexual organs in their development. They are rather more dependent upon other organs or organ systems and can even exist when the gonads are atrophic.
—F. S. H.

(GONADS) Abnormal menopause. Gillam (H. A.), Kentucky M. J. (Bowling Green), 1922, **20**, 159.

(GONADS) A brief review of the physiological and embryological genesis of pseudohermaphroditism with report of a case. Goldberger (M. A.), Am. J. Obst. & Gynec. (St. Louis), 1922, **4**, 130-134.

The author suggests that pseudohermaphroditism may be more frequent in lower animals than in the human being, cases having

been reported in cladocera, crustacia, birds and cattle. Cattle often deliver themselves of twins. It frequently happens that the female co-twin, the other being a male, is usually sterile and has a modified genital tract, thus resembling the human pseudohermaphrodite. These animals are known as free martins and their gonads as free martin gonads. The structure of the latter may be any degree of transformation of the **ovary** into the **testis**, as a result of the hormone action of the testis of the male co-twin. Atypical gonad development in the human pseudohermaphrodite cannot be explained on the basis of the hormone action of a male co-twin, but knowing that sex determination is transmitted through the primary germ cell, is it not possible that this sex determination for some unknown reason is perverted, and that this perversion is inherited? The author describes a case of pseudohermaphroditismus feminus externus with a gonad in the right labium which he presumes was a rudimentary testis, possibly to be classed as similar to a free martin gonad of cattle. (It was not removed.) The uterus, tubes and ovaries were apparently absent.—E. N.

(GONADS) The falsetto voice in the male—with a demonstration of four cured cases. Green (J. S.), Laryngoscope (St. Louis), 1921, **31**, 33-41.

Voice in childhood is essentially the same in both sexes. The larynx develops but little between the age of 5 years and puberty; however, in boys there is a gradual increase in the pectoral tones. After puberty is reached, concomitant with general system changes, pronounced changes of larynx and voice takes place. In boys the larynx shows rapid growth, especially in the transverse diameter. In girls the growth is mainly vertical, the larynx remains small, delicate and highly nervous. Growth of the larynx is accompanied by enlargement of the glottis. The position of the larynx is a little higher in women than in men. Falsetto voices are found in both sexes after sex maturity. The term "eunuchoid voice" has been used as synonomous with that of falsetto voice. This interchange of phrases is to be deplored for the reason that a falsetto voice may occur in a person fully developed sexually. In practically all cases a falsetto voice is the result of a faulty habit contracted at the time the voice is changing and retained in later life.—H. W.

(GONADS) Oxytocic substances in the PLACENTA [Die Wehensubstanzen in der Placenta (Erwiderung auf den Artikel: Organextrakte als Wehenmittel)]. Guggisberg (H.), Monatschr. f. Geburtsh. u. Gynaek. (Berl.), 1921, **54**, 277-279.

Guggisberg finds that extracts of all the glands of internal secretion have a stimulatory action upon the uterine muscle, but that this action is most pronounced in extracts of the **thyroid** and placenta (the **pituitary** gland being excepted). The activity of the

extracts is referred to a proteinogenic amine. The fluid obtained from the placenta by the Buchner process is free from lipoid and protein and is not poisonous for man or for rabbits. From clinical experimental work, it was found that the extract has the most pronounced effect during the first stage of labor. When it is administered in conjunction with pituitary extract, the effect is more marked. Pituitrin works best during the second stage and it is conceivable that this is due to the mobilization during the first stage of some material, which makes the uterine muscle more susceptible to the action of pituitrin. Clinically the writer uses simultaneous injections of the two extracts (placenta and pituitary), especially during the first stage, when pituitrin alone is of little avail. Shortly after the injection the pains, which were weak and infrequent previously, become stronger and longer, while the interval is shortened. The effect of the extracts continues for a surprisingly long time. Failures were very few and there were no untoward effects on the child. The combination also works well in the second stage, but little stress is placed on this action, because it is difficult to determine what part the placental extract plays, since the pituitrin alone is so efficient.—Am. J. Obst. & Gynec., 1922, **4**, 206.

(GONADS) Bidder's organ and the secondary sex characters in the toad (Bufo vulgaris Laur) [L'organe de Bidder et les charactères sexuels du crapaud (Bufo vulgaris Laur)]. Guyénot (E.) & Ponse (K.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 751-752.

Recently Harms has reported that the secondary sex characters in the toad are dependent in part on Bidder's organ. From experimental evidence the authors arrive at an exactly opposite conclusion. After ablation of Bidder's organ there is development of the digital excrescences, mating, clasping reflex very clear, and living descendants. The excrescences are identical with the controls. After ablation of the testicles there are no digital excrescences, no sexual attraction, no clasping reflex. The same is true for ablation of both Bidder's organ and the testicles. It is concluded that the secondary sex characters in the toad, as in general, are dependent on the testicles and not on Bidder's organ. The latter is perhaps a rudimentary organ, bearing the same relation to the gonads that the pronephros bears to the unesonephros.—T. C. B.

(GONADS) Anatomo-clinical observations of the relation between the evolution of the CORPORA LUTEA and the appearance of menstruation (23 observations) [Recherches anatomo-cliniques sur les rapports entre l'évolution du corps jaune et l'apparition des règles (23 observations)]. Henry (J. R.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1162-1164.

Examination of the ovaries removed from 23 women at varying phases of their menstrual cycle leads to the conclusion that there is no chronological relation between the development of the corpus

luteum and the appearance of menstruation. They vary greatly according to the subject and under the influence of causes that cannot be fixed. There are women menstruating regularly in whom no corpora lutea in evolution can be discovered.—T. C. B.

(GONADS) Specific OVARIAN secretion (Ueber das specifische Ovarialsekret). Herrmann (E.), Zentralbl. f. Gynäk. (Leipz.), 1921, **45**, 501.

Polemical against Fellner.—F. S. H.

(GONADS) Some moot points in the diagnosis of the causes and in the treatment of sterility. Hirst (B. C.), Am. J. Obst. & Gynec. (St. Louis), 1922, **4**, 160-165.

Of no endocrine interest except in emphasizing the importance of the rôle of "lack of genital sense," and also of adiposity.—E. N.

(GONADS) Increased blood sugar coincident with OVULATION in pigeons. Honeywell (H. E.) & Riddle (O.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 377-380.

The results indicate that the stage with reference to ovulation is probably a factor influencing the values obtained for blood sugar of other animals and is probably too large a factor to be left out of consideration in dealing with samples taken from reproducing females. The essential similarity of the curve expressing the rise of the blood sugar with the curve expressing the coincident hypertrophy of the **adrenals** is evidence of a relation of the latter to carbohydrate metabolism and to sexual function. The enforcement of ovulation throughout the year is accompanied by an increased carbohydrate mobilization.—F. S. H.

(GONADS) On an OVARIAN neoplasm of the follicular type (Sur une néoplasie ovarienne offrant des dispositions de type folliculaire). Lagarde (R.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1159.

Morphological.—T. C. B.

(GONADS) Development of interstitial glands (Zur Entwicklung der interstitiellen Geschlechtsdrüse). Lahm (W.), Monatschr. f. Geburtsh. u. Gynäk. (Berl.), 1922, **58**, 128-141.

See Endocrin., **6**, 701.

(GONADS) X-ray versus surgery in the treatment of fibroid tumor of the uterus. Lane (J. L.), Northwest Med. (Seattle), 1922, **21**, 241-243.

The author points out some of the advantages of x-ray therapy as compared with surgery in fibroids of the uterus. Amenorrhea is produced, and thus the most dangerous symptom, hemorrhage, is pre-

vented. The x-ray menopause he finds somewhat milder than that following surgical castration, and if the dose can be graduated to destroy the **ovarian** follicles but leave the **interstitial tissue** intact, the endocrine effect of the ovary would not be destroyed and the after symptoms mild if at all present. Other factors such as mortality and expense are mentioned.—H. L.

(GONADS) An early stage of the free-martin and the parallel history of the interstitial cells. Lillie (F. R.) & Bascom (K. F.), Science (N. Y.), 1922, **n. s. 55**, 624-625.

The theory that the intersexual condition of the free-martin depends upon hormones secreted by interstitial cells of the testis of the male twin has presumed that the male hormone is effective shortly after the beginning of sex-differentiation in the embryo. The earliest stage of the free-martin hitherto described is 7.5 cm. The gonads of a 3.75 cm. free-martin are described as being much less than half the bulk of those of normal males and females of a corresponding age. The cortex of the **ovary** is only about one-fifth the thickness of that of the normal female of corresponding age. The following conclusions are drawn. The appearance of interstitial cells in the **testis** at the very time that a male hormone may be demonstrated by its physiological effects (free-martin) is strong evidence that these cells secrete the sex hormone. The absence of such cells in the female and the corresponding lack of effect of the female blood on the male twin argue in the same sense. In the female of cattle sex-differentiation before birth is apparently due to genetic factors exclusively; in the male the genetic factors are intensified by the production of a hormone.

(GONADS) On the internal secretion of the sexual glands. Lipschütz (A.), J. Physiol. (Lond.), 1917, **51**, 283-286.

Reviewing briefly the known experimental data on the question, Lipschütz describes the external genitalia of a female guinea-pig into which **testes** had been implanted. He concludes that the testis has evoked a transformation of the clitoris into a penis-like organ. Moreover the body temperature of the feminized males corresponds to that of the normal female. It is therefore concluded that the **puberty glands** of the female tend to increase the body temperature.—F. S. H.

(GONADS) Hypertrophy of OVARIAN fragments (Nouvelles observations sur l'hypertrophie des fragments ovariens). Lipschütz (A.) & Wagner (C.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1122-1123.

In making a laparotomy on a female rabbit that had been castrated 18 months before, it was noticed that the uterus was more developed than in the normal controls from the same litter. Two

ovarian fragments were found near the uterus, left behind at the time of operation. The ovules were reduced in number but the follicles were not. This reaction of the uterus, so sensitive to variations in the endocrine function of the ovaries, was due to the fragments, and the internal secretion of the ovary was due to the number of cells derived from the follicular development of the ovules, rather than from the number of ovules themselves.—T. C. B.

(GONADS) Is the hypertrophy of the interstitial cells of the TESTICLE a compensatory endocrine reaction (L'hypertrophie des cellules interstitielles du testicule est-elle une réaction compensatrice endocrine)? Lipschütz (A.) & Wagner (C.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 15-17.

Further evidence in support of their contention that the hypertrophy of the interstitial tissue in testicular fragments is not a compensatory endocrine reaction.—T. C. B.

(GONADS) Hypertrophy of the TESTICLE in unilateral castration (Sur l'hypertrophie du testicule dans la castration unilateral). Lipschütz (A.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 60-62.

Affirmation of the thesis that the greater weight of the remaining testicle after unilateral castration is due to an acceleration of development, and that hypertrophy does not take place.—T. C. B.

(GONADS) The minimal quantity of the TESTICULAR mass sufficient for complete masculinization (Nouvelles observations sur la quantité minimale de masse testiculaire suffisante pour une masculinisation complete). Lipschütz (A.), Wagner (C.) & Kropman (E.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 122-124.

An answer to their critics with new observations on a guinea-pig and two white mice. Contains no novel additions to present knowledge.—T. C. B.

(GONADS) The influence of the internal secretions of the TESTIS on blood pressure (Über die Wirkungen des inneren Sekrets der Keimdrüsen auf den Blutdruck). Loewenthal (M.), Klin-therap. Wchnschr. (Wien & Berl.), 1921, **28**, 355-361.

The internal secretion of the testis produces changes of blood pressure only indirectly by increasing the tone of the sympathetic system. **Ovarian** secretion increases vagus tone, and also produces local vaso-dilatation.—Physiol. Abst., **7**, 315.

(GONADS) The flies on the chariot wheel. Lydston (G. F.), Illinois M. J. (Oak Park), 1922, **42**, 97-101.

A discussion, in a series of categorical statements, of the virtue of giving credit to whom credit is due. Lydston claims priority in being the first surgeon successfully to transplant a **testicle** from one

human being into another, the first to transplant a testicle from a dead human being to a living human being (Lydston himself being the recipient), and the first successfully to transplant an ovary from a dead woman to a living woman. The author states that writers on this subject are prone to omit mention of his name as one who has done pioneer work in this field.—I. B.

(GONADS) The OVUM as an internal secretory organ. McIlroy (A. L.), N. York M. J. [etc.], 1922, **115**, 404-406.

A short paper of rather theoretical interest pertaining to the ovum as an incretory organ.—H. W.

(GONADS) The male sexual glands in the prevention of creatinuria. McNeal (M. D.), Am. J. M. Sc. (Phila.), 1922, **164**, 222-227.

Data are presented regarding two eunuchs, three men with a congenital testicular defect, and one man with a defect acquired at the age of 27. The men who were castrated at the ages of 29 and 47, respectively, excreted creatin. Analysis of the urine of the three men with congenital defects, and one with a deficiency acquired at the age of 31, showed the presence of creatin regularly. Besides the sexual incompetence on an organic basis in one of the congenital defects a diagnosis of **diabetes insipidus** was made—J. F.

(GONADS) Can Steinach's operation produce rejuvenation of the animal organism (L'opération de Steinach peut-elle realizer le rajeunissement de l'organisme animal)? Marinesco (M. G.), Bull. gén. de thérap. [etc.] (Par.), 1922, **173**, 335-368; Presse méd. (Par.), **30**, 309-311.

A review and a discussion best summed up in the quotation: "If Steinach had been better acquainted with the histological and physico-chemical processes which characterize senility, or even the non-reversibility of biological phenomena in general, he quite probably would have hesitated before speaking of rejuvenation."

—F. S. H.

(GONADS) "PLACENTA-OPTON" as oxytocic (Placenta-Opton als Wehenmittel). Martin (E.), Monatschr. f. Geburtsch. u. Gynaek. (Berl.), 1921, **54**, 288-291.

To test the efficacy of Merck's Placenta-Opton, Martin selected 6 patients, in whom the membranes had ruptured before the onset of labor. After several hours' observation, in each patient with the pains absent or very weak and irregular, an ampoule of the Placenta-Opton was injected intramuscularly. Within a few minutes after the administration of the drug, contractions become more severe and recurred at closer intervals. In no case was there any apparent harmful effect on mother or child. He was not able to start pains in patients who gave no signs of being in labor, but is quite con-

vinced that rhythmic uterine contractions can be induced by the substance when the patient is at term.

—Am. J. Obst. & Gynec., 4, 207.

(GONADS) Non-teratoid tumors of the OVARY (Essai sur les tumeurs non teratoides de l'ovaire). Masson (M. P.), Gynéc. et Obst. Rev. (Par.), 1922, **6**, 81-105.

A histo-pathological study.—F. S. H.

GONADS) Brief considerations of the secretion of the mammary glands from the point of view of therapeutics (Breves consideraciones sobre la secreción mamaria desde el punto de vista terapéutico). Montaño (A.), Observador Med. (Mexico), 1920, **1**, 174-181.

Report of one case in which the injection of homologous milk facilitated the function of lactation.—F. S. H.

(GONADS) The formation and function of the CORPUS LUTEUM (Zur Frage der Bildung und Funktion des Corpus luteum). Novak (J.), Zentralbl. f. Gynäk. (Leipz.), 1921, **45**, 960-962.

Controversial with Sieber. Nothing new.—F. S. H.

(GONADS) Arterial hypertension following castration in women (L'hypertension artérielle consécutive à la castration chez la femme). Paillard (H.), J. méd. franç. (Par.), 1921, November; abst., Rev. franç. de gynéc. et d'obst. (Par.), 1922, **17**, 65.

Among 25 women with hypertension were 14 in whom the menopause had been produced (12 by operation, 2 by radiotherapy). Conversely, of 31 castrated women, 13 presented a tendency to, and 3 a definite hypertension. The author explains this hypertension on the basis of work showing that ovarian extracts cause hypotension, being thus antagonistic to the adrenals. Castration causes adrenal hypertrophy, this, in turn, being responsible for the hypertension, according to the author.—E. N.

(GONADS) Sobre etilogia del glaucoma. Paltracca (E.), Gior. di Ocul., Nov. 11, 1921; abst., Rev. Sud-Am. (Buenos Aires), 1922, **5**, 229.

Glaucoma, more frequent in women than men, is observed in those who have passed 60 years of age. The author believes in the possibility that the origin is endocrine. Ovarian as well as testicular extract diminishes the ocular tension in those subjects who for some time have been at the critical age or period, but in the young normal individual it is without effect. In glaucoma the extract causes the endobulbar tension in the unaffected eye to diminish a great deal, but it exerts scarcely any action upon the glauco-

matous eye. If by iridectomy the glaucomatous eye is restored to normal tension opotherapy will maintain it so.—W. H.

Case of premenstrual psychosis (Sur un cas de psychose menstruelle). Parhon (C. J.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 53-57.

Not suitable for abstracting.—F. S. H.

(GONADS) Action of cerebral and OVARIAN lipoids in epilepsy (Action de lipoïdes cérébraux et ovariens dans l'épilepsie). Parhon (C. J.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 63-65.

The effect of the intravenous injection of cerebral lipoids was negative. The same obtained in the one case tried with ovarian lipoids.—F. S. H.

(GONADS) ORCHITIC lipoids in epilepsy (Action des lipoïdes orchitiques dans l'épilepsie). Parhon (C. J.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 65-68.

Parhon feels from observations on five patients that the administration of orchitic lipoids reduces the number of epileptic attacks. —F. S. H.

(GONADS) Case of Dercum's disease (Sur un cas de syndrome de Dercum). Parhon (C. J.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 66-70.

A case of adiposis dolorosa occurring at the menopause. Parhon believes that the disorder is pluriglandular and in part attributable to disturbance in the genital gland functions, particularly an insufficiency.—F. S. H.

The glycogen content of liver and muscles in castrated animals (Sur la teneur en glycogen du foie et des muscles chez les animaux chatrés). Parhon (M.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 741-743.

The quantity of glycogen in liver and muscles depends on the time at which the animals are sacrificed after castration. Six weeks after castration there is a slight diminution of hepatic glycogen, but no appreciable difference in the muscles. If, however, the animals are allowed to live a year, there is a marked diminution in the liver and muscle glycogen. It is suggested that this is due to a disturbance of other endocrine glands, the result of the castration.—T. C. B.

(GONADS) Significance and origin in OVARIAN tumors of certain arrangements recalling those of a cylindroma (Signification et origine dans les tumeurs de l'ovaire de certaines dispositions rappellant celles du cylindrome). Peyron (A.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1156-1159.

Morphological.—T. C. B.

(GONADS) Therapeutic use of PLACENTAL extracts (Die Therapeutische Verwertung der Placenta). Puppel (E.), Monatschr. f. Geburtsh. u. Gynaek. (Berl.), 1921, **54**, 280-288.

Puppel employed a 5 per cent solution of Merck's "Placenta-Opton" and gave the preparation intramuscularly but never intravenously. After a limited experience he draws the following conclusions. Placenta-Opton can be used therapeutically to increase the severity of the pains in any stage of labor. The intramuscular injection of this substance has a good effect upon all menstrual disorders due to hypofunction of the uterus.

—Am. J. Obst. & Gynec., **4**, 206-207.

(GONADS) New investigations on the biology of the OVARY (Nuevas investigaciones acerca de la biologia del ovario). Ramirez (E.) & Ochoterena (I.), Rev. Mex. de biol., 1920, **1**, 88-107.

Histological studies of the ovary during the various stages of menstruation or heat in animals. From the observations made, the authors are of the opinion that the secretion of the **corpus luteum** produces the necessary modification of the uterine mucosa essential for nidation. If fecundation occurs there is a transformation into the corpus luteum of pregnancy which has a special function. There is an antagonistic action existing between the corpus luteum and the **interstitial cells.** When the former recedes the secretory action of the latter becomes manifest. The secretion of the interstitial cells is considered as the determinative cause of menstruation for during this period the action of the corpus luteum ceases while the interstitial cells yield a picture of intense activity. The ovarian congestion of menstruation favors ripening of the ovum, which in turn impedes corpus luteum development.—F. S. H.

(GONADS) Local and general effects due to the resection of the vas deferens (Effets locaux et genereaux dus à la resection des canaux deferents). Retterer (E.) & Voronoff (S.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1073-1075.

A histological explanation of the preservation of sexual ardor and power after resection of the vas deferens.—T. C. B.

(GONADS) Vasectomy on the dog as regeneration experiment (Vasektomie beim Hunde als Regenerationsexperiment). Sand (K.), Ztschr. f. Sexualwissensch. (Berl.), 1922, **8**, 3-8.

Report of the beneficial effects of vasectomy on one old dog.

—F. S. H.

(GONADS) Experimental hermaphroditism (De l'hermaphrodisme experimental). Sand (K.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1017-1024.

Simple transplantation and inversion show that we can utilize the influence of uncombined hormones, and we are led to ask if it is

not possible to use the combined influence of the male and female gonads, and thus produce hermaphrodites. The author experimented on a young castrated male guinea pig. Transplantation of an ovary was made in the right abdominal wall, and a testicle on the left side. The combined influence of the two glands was shown by the development of the penis and by the development of the mammary glands, which secreted milk and were histologically of the puerperal type. Psycho-sexually the animal was often bi-sexual, passing in the course of an hour from a placid female to a violent male when put near a male, or a female, or a new born animal. The technique of Sand's method of intratesticular implantation of the ovary is given and the results of experiments described. Of 10 infantile guinea pigs thus operated upon, 2 developed positive hermaphroditism; the penis was normal compared to the controls, but, whereas in the controls the nipples were very small, in the operated animals the mammae were turgescent and secreted an abundance of milk. Of 6 guinea pigs operated upon at puberty, 2 gave successful results. The results in animals of an advanced age are not clear. The histology of the ovario-testicles is given. The work is published in extenso in the "J. de Physiol. et de path. gén."—T. C. B.

(GONADS) Formation and function of the CORPUS LUTEUM (Zur Frage der Bildung und Funktion des Corpus luteum). Sieber (H.), Zentralbl. f. Gynäk. (Leipz.), 1921, 45, 332-340.

No new data.—F. S. H.

(GONADS) Some aspects of sterility. Solomons (B.), Irish J. M. Sc. (Dublin), 1922, 5s, 303-313.

In dealing with sterility from constitutional causes the glands of internal secretion must in these days present themselves pari passu, at any rate, with other causes. They are all important and most important of all is the **corpus luteum.** For a patient who has scanty menstruation, or none, the result following the administration of corpus luteum is in some cases nothing short of miraculous. In one case, where the patient had never menstruated, the drug apparently started menstruation, six months after which pregnancy occurred. This patient did not nurse her child and menstruation did not return. After two years she wrote expressing her impatience at the absence of pregnancy. Corpus luteum was again recommended, menstruation returned for two months, after which she again became pregnant. The dose recommended is 5 grains daily for two days, then gradually increasing the amount until at the end of another month 10 grains three times daily are being taken. Anaphylaxis has never been noticed. The great disadvantage of the treatment is the expense, especially for dispensary patients. Parke Davis capsules of corpus luteum have been ordered always. The best results have been obtained with corpus luteum. Whole ovarian gland has also been used very successfully, both by mouth and

hypodermically. Where excessive obesity is found in association with sterility, and scanty or absent menstruation, **thyroid** extract is prescribed, in addition to a vigorous anti-fat diet. This is administered in ½ grain doses three times daily, an amount which is found sufficient when the dietary is properly carried out. **Pituitary** extract, **testicular** extract, and many pluriglandular preparations have been tried, but with little success, and there seems to be very little doubt from clinical experience that the corpus luteum, as stated by Novak in his recent work, supplies the internal secretion which is chiefly concerned with menstruation, and on its activity pregnancy depends to a large extent.—Excerpted.

(GONADS) Interstitial cells of the TESTICLE (Ueber die Zwischenzellen des Hodens). Sternberg (C.), Wien. klin. Wchnschr., 1922, **35**, 633-634.

A short general review.—J. K.

(GONADS) Heterogenous TESTICULAR grafting in man with histologic proof of the taking of the graft. Thorek (M.), Northwest Med. (Seattle), 1922, **21**, 256-257.

See Endocrin, 1922, **6**, 771-775.

(GONADS) Pubertas praecox. Tierney (J. L.), Med. Clin. N. Am. (Phila.), 1922, **6**, 31-60.

The subject of precocious puberty is discussed and the literature reviewed, with special emphasis upon the various endocrine implications. The article must be read in its entirety to be appreciated. The following are the author's conclusions. The most common etiological factor in pubertas praecox is **hypergonadism**, with **adrenal** cortex and the **pineal** next in frequency. In the male, this sexual precocity may be produced by neoplasm and hyperplasia of the **testes**, suprarenal cortex and pineal. In the female, most cases of sexual precocity are due to **hyperovarianism**, rarely to the pineal; and it is probable that most cases of sexual precocity attributed to the adrenal cortex have been really cases of virilism rather than true feminine precocity, the masculinity being manifested by hypertrichosis, male cast of countenance, mustache, beard, and hypertrophied clitoris, without the appearance of true feminine secondary sex characteristics or precocious menses. In regard to treatment, if the condition be one of hypersecretion, the logical procedure should be, in the case of tumor, surgery, and in the case of hyperplasia or hyperactivity, in the absence of demonstrable tumefaction, properly directed radiation or suitable antagonistic endocrine therapy.—I. B.

(GONADS) A surgical study of 230 OVARIAN transplantations (Etude chirurgicale sur 230 greffes ovariennes). Tuffier (T.), Bull. Acad. de méd. (Par.), 1921, **86**, 99-106; abst., Rev. franç. de gynéc. et d'obst. (Par.), 1922, **17**, 38-41.

Tuffier's 230 transplantations were performed for one of two indications, viz.: (1) the conservation or re-establishment of menstruation after ablatation of the ovaries, when the uterus has been conserved; (2) the effort to mitigate the disturbance produced by removal of both the uterus and the ovaries. Homotransplantation (i. e., from one woman to another) has been done in 20 cases. It has never been successful in re-establishing menstruation, nor has it ever entirely suppressed menopausal symptoms. Autotransplantation (transposition of one or both ovaries from the pelvis to some other region in the same woman) has been done 203 times. In 73 women in whom the author had transplanted the ovary (with conservation of the uterus) and in whom he reviewed the results in from 4 months to 12 years after the operation, 56 had menstruated regularly. The author propounds an interesting theory as to the cause of the symptoms following ovariectomy or hysterectomy. Throughout the reproductive life of the woman the organism, probably through the endocrine glands, produces a toxin whose concentration increases throughout the month and acts upon the ovary. It also has an effect upon the uterine mucosa, allowing the blood elements to escape, and thus finding an escape for itself also. If the ovaries are removed, the toxemia is maintained, menstruation not occurring. Thus are produced the menopausal symptoms. Again, if the uterus is removed, the ovaries being retained, the uterine outlet is removed, and again there is retention of the toxin, with unpleasant symptoms as a result. (For further data on the problem of ovarian transplantation see exhaustive reviews of Franklin Martin, Surg. Gynec. & Obst. (Chicago), 1917, **25**, 336; Ibid., 1915, **21**, 568; Ibid., 1911, **13**, 303. See also Chalfant, S., Ibid., 1915, **21**, 579).—E. N.

(GONADS) An experimental investigation of the CORPUS LUTEUM in its relation to the toxemias of pregnancy). Wallis (R. L. M.) & Williams (H. G. E.), Lancet (Lond.), 1922, **i**, 784-786.

This is a brief preliminary communication. The authors studied the corpus luteum to attempt to determine whether it might be a factor in the toxemias of pregnancy. The reason given for attacking the corpus luteum is that this body is always present throughout pregnancy, even in a molar pregnancy, and for about fourteen days thereafter. After many attempts at extracting an active principle from the corpus luteum of the hog and from that of woman, removed at operation, by extraction of fresh gland with alcohol in the cold they finally succeeded in isolating a refractile substance in some way related to the lipoids. When 5 cc. of a water solution of this extract was given intravenously in a rabbit, death occurred within a few hours, before definite lesions were produced. Other animals receiving sublethal doses over a longer period showed massive necrosis of the kidney tubules and slight liver necrosis in the peri-

portal regions of the liver lobules. Extracts of the placenta and other organs proved to be non-toxic. It was found that the blood of a pregnant woman or that of a woman during the menstrual period destroyed the new extract of corpus luteum, whereas the blood of non-pregnant women and that of men did not have such an effect, the toxicity not being destroyed. This is, therefore, suggested as a test for pregnancy. The change produced in the toxic substance by the serum is detected by the refractometer. Simultaneous injection of cholesterol greatly modifies the toxic effects. The authors, therefore, conclude from their few experiments that eclampsia is due to hyperactivity of the corpus luteum of pregnancy. That hypercholestinemia of pregnancy is most marked in eclampsia, is cited as supporting this view.—I. M.

(HYPOPHYSIS) La HIPOFISIS, estudio clinico-terapéutico. Alou (P.), Union méd. Espania, Jan. 7, 1922; abst., Rev. Sud-Am. (Buenos Aires), 1922, **5**, 228.

Alou employes the injectable hypophyseal extracts and "hypophysina" with very satisfactory results in the following pathological states: in **exophthalmic goiter,** in which he obtains diminution of the volume and weight of the gland; in **adrenal** insufficiency, in which it provokes hypertrophy of the gland; usually in epilepsy; in acute myocarditis of toxic-infectious processes; in myocarditis and cardiac valvular insufficiency, except the aortic with hypertension, alternating its use with digitalis; in the menopause, accompanied by affections of the **ovary**; in all those asthenic conditions, gastric myasthenia, convalescence from infectious diseases; in essential diabetes insipidus and urinary incontinence; in inertia of the uterus; in dysmenorrhea; in sexual impotence; and in backward physical-mental conditions, when thyroid extracts has not given results. —W. H.

(HYPOPHYSIS) A peculiar form of pituitary disturbance. Appelbaum (E.), N. York M. J. [etc.], 1922, **115**, 419.

Description of a case of Reichman's type of pituitary disorder. A woman of 21 years suffered with severe headaches for 10 years, weakness, anorexia of 3 years' duration, cyanosis of the face for 18 months, menstrual disturbances, exophthalmos and dilated pupils. She had acromegalic features, hands and feet; her heart was slightly hypertrophied to the left; the reflexes were normal. Urine was negative and Wassermann examination was negative. The red cell count was 4,550,000, the white 12,000. The differential count showed neutrophiles, 46 per cent; lymphocytes, 46 per cent; and transitional cells, 8 per cent. The spinal fluid showed 30 cells, a normal pressure, and was clear with a trace of globulin and it reduced Fehling's solution. X-ray examination showed erosions of the posterior clinoid process of the sella turcica.—H. W.

(HYPOPHYSIS) Three cases of supra-pituitary tumour presenting Fröhlich's syndrome. Armstrong (C. N.), Brain (Lond.), 1922, **45**, 113-125.

Results of pre- and post-mortem examination of three cases are given. A male of 10, somewhat adipose, of feminine type, with normal genitalia, and reduced visual acuity, and a female, 35, enormously fat, with fine, soft, dry skin, small visual acuity, and some polyuria showed cystic ependymomas, walnut sized, flattening the pituitary, which appeared to be of normal size in the first. The third case, a female of 18 years, with the appearance of 12 to 14 years, childish, cheerful, very fat, with little body-hair and much diminished visual acuity, showed a cholesterol-containing cyst filling the sella turcica.—A. T. C.

(HYPOPHYSIS) Tumor of the PITUITARY, report of case. Baldauf (L. K.), Kentucky M. J. (Bowling Green), 1922, **20**, 610-612.

The diagnosis of pituitary tumor was made on a man of 50 years because of drowsiness, rapid increase in weight, right temporal hemianopsia, nervousness and irritability, and sexual impotence. The Wassermann reaction was negative.—H. W.

(HYPOPHYSIS) The antidiuretic effect of pituitary extract applied intranasally in a case of DIABETES INSIPIDUS. Blumgart (H. L.), Arch. Int. Med. (Chicago), 1922, **29**, 508-514.

The prompt though transitory effect of injections of pituitary extract in controlling the thirst and polyuria in diabetes insipidus is well known. If the extract is administered by mouth (even in gum drops), by colonic irrigation or by suppositories, this beneficial action is not obtained. Injections, however, are inconvenient and expensive and difficult for long continued use. A patient was studied whose daily urine output was 6 to 9 liters. Injection of only 0.005 cc. of pituitrin "O" (Parke Davis) was promptly effective in markedly diminishing urinary output. Pituitrin by mouth, posterior pituitary tablets by mouth, pituitary extract by rectum, lumbar puncture, and histamin sprayed, swallowed or subcutaneously were entirely ineffectual. Extract of the posterior lobe (1.5 cc.) sprayed intranasally every three or four hours controlled and checked the polydypsia and polyuria just as effectively as when administered by injection. The author believes that the effect of pituitary extract intranasally and subcutaneously is a diminution of the water intake and urinary output with a corresponding alleviation of thirst, a rise in the specific gravity of the urine and a dilution of the blood.—H. L.

HYPOPHYSIS and its posterior lobe considered pharmacologically. Borrien (V.), J. de pharm. et chim. (Par.), 1922, **25**, 344-348.

The active principle of the posterior lobe is very diffusive in H_2O and EtOH, is analogous in comparison to adrenaline, but thus

far has not been isolated. To preserve the lobes for several days after collection, weigh, then immerse them in a small amount of physiological 0.7% solution to which 0.5% PhOH and 5 to 6 drops of AcOH per 100 cc. are added, and keep the preparation in a well corked flask.—Chem. Abst., **16**, 2574.

(HYPOPHYSIS) DIABETES INSIPIDUS. Cables (H. A.), Illinois M. J. (Oak Park), 1921, **40**, 28.

A brief review of etiological theories and diagnosis of diabetes insipidus, with report of three cases in married women. In the first patient, 35 years of age, the polyuria dates from the age of 12, with a quantity of 8½ quarts daily, and a specific gravity of 1001. The second, 25 years old, dates her condition from the age of 13, following an attack of measles. In this case the quantity was 8 quarts; the specific gravity, 1002. The third patient, 33 years old, suffered with polyuria from the time of an attack of scarlatina 12 years before. The quantity was 7 quarts; the specific gravity, 1002. In each of these cases the administration of desiccated whole pituitary gland resulted in immediate relief, which thus far appears permanent. With a decrease of urinary output there was an increase of urinary concentration to normal.—I. B.

A case of DIABETES INSIPIDUS due to lesion of the infundibulum (Un cas de diabète insipide par lésion de l'infundibulum). Camus (J.), Roussy (G.) & Le Grand (A.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 719-722.

The patient was admitted to the hospital for epileptiform convulsions and fugitive paralysis. There was an abundant polyuria (7-8 liters) without glycosuria. Injection of extracts of the posterior lobe of the pituitary resulted in lessening the polyuria by one liter; another time from 8 liters to 5½ liters; a third time it had no effect. It could also be reduced by antipyrine, novocaine, and lumbar puncture. Death occurred after an attack of sever vomiting. At autopsy there was found an abscess the size of a small nut which destroyed the pituitary entirely. Macroscopically, there was no apparent lesion of the infundibulum. Microscopically, however, there were important interstitial and cellular lesions of the optopeduncular region comparable in all points to those described by Lhermitte. The authors point out that a simple macroscopic examination of this case would confirm the hypophyséal origin of polyuria, but the microscopical examination shows the polyuria to have been due to a lesion of the nuclei of the infundibulum and tuber cinereum.

—T. C. B.

HYPOPHYSECTOMY in the dog and the cat. Technique and results of 149 operations (Hypophysectomie chez le chien et le chat. Technique et resultats de 149 interventions). Camus (J.) & Roussy (G.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1008-1010.

Numerous observations on the physiology of the hypophysis have not definitely established whether it is essential to life. The authors have operated on 122 dogs and 27 cats, using both the buccal and the temporal route in removing the hypophysis. Of 98 dogs operated upon through the mouth, 22 died during the operation, or in less than 24 hours after; 35 died in a few days; 14 in a few weeks; 12 in from 2 to 11 months; 12 were sacrificed a long time after the operation; the rest were living at the time of writing. Of those operated upon by the temporal route, 7 died in less than 24 hours; 8 in a few days; 2 in a few weeks. The rest are still living. Similar results were obtained in cats. In the majority of cases where death followed total ablation of the hypophysis the autopsy showed either meningitis, hemorrhage or lesion extending to the base of the brain. The possible causes of death are discussed and it is concluded that the hypophysis is not necessary to life.—T. C. B.

(HYPOPHYSIS) Anatomo-pathological study of experimental lesions causing polyuria and the adiposogenital syndrome in the dog (Etude anatomo-pathologique des lesions polyurique et le syndrome adiposo-genital chez le chien). Camus (J.), Roussy (G.) & Le Grand (A.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1070-1073.

A description of the lesions found in some of the most pronounced cases of polyuria and adiposogenitalis occurring in a series of 149 dogs, previously reported, in which an experimental lesion in the opto-peduncular region had been made.—T. C. B.

(HYPOPHYSIS) Case of hypopituitary disorder (Fall von Hypopituitrismus). Cieszynski (F. K.), Przegl. lek. (Kraków), 1921, **60**, No. 4.

A boy of 13 years of underdeveloped height, with typically developed fat deposits, testicle agenesis and a somewhat myxedematous skin. Since no significant tumor of the hypophysis was in evidence the author considers it a case of hypofunction.—F. S. H.

(HYPOPHYSIS) Study of some cases of DIABETES INSIPIDUS with special reference to the detection of changes in the blood when water is taken or withheld. Christie (C. D.) & Stewart (G. N.), Arch. Int. Med. (Chicago), 1922, **29**, 555-566.

The regulation of the excretion of water by the kidneys was studied in two cases of diabetes insipidus presenting the typical features, and in one case of polyuria of acute onset, apparently associated with a brain lesion. In the last case the polyuria (12 liters per day) disappeared permanently after lumbar puncture. Blood specimens obtained immediately before and immediately after a long period of complete deprivation of water (24 hours or more) showed no definite differences in the electrical conductivity of the

serum, which could be associated with changes in the rate at which water was being absorbed, transported and excreted, although the conductivity can be measured with great accuracy. The same was true of the percentage volume of serum. The various tests of efficiency of renal function gave normal result. When pituitary extract was administered the kidney showed normal powers of concentrating the urine.—H. L.

Influence of the HYPOPHYSIS on dysfunction of the sexual organs (Der Einflusz der Hypophyse auf die Dysfunktion der Genitalorganen). Dietrich, Klin. Wchnschr. (Berl.), 1922, **1**, 1760.

A short note. The author describes a case of "adipositas hypogenitalis hypophysaria" which is a "forme fruste" of Fröhlich's disease. After injection of adrenalin hyperglycemia is retarded. No details are given.—J. K.

(HYPOPHYSIS) The normal sella. Enfield (C. D.), J. Am. M. Ass. (Chicago), 1922, **79**, 934-935.

Roentgenograms of 100 cases of all types of disease, excluding endocrine disturbance and "pituitary types," were taken with a view to establishing a normal if such could be done. With the technique used Enfield finds the width varying from 6 to 19 millimeters and the depth from 3 to 12 millimeters. Outline tracings from 9 cases are given. He finds a female preponderance in the so-called closed type and a male preponderance in the unusually large ones. The size of the sella was not proportionate to the size of the body. His general conclusion is that the only definitely abnormal roentgenographic finding is clear evidence of erosion of the bony structure.—W. M. A.

(HYPOPHYSIS) Glycosurie dans l'ACROMEGALIE. Etienne (G.), Drouet (L.) & Yovanovitch-Brintcheva (B.), Rev. méd. de l'est (Paris & Nancy), 1922, **50**, 271-279.

A woman of 37 years is described. The sella turcica was enlarged. She gave a positive Goetsch test. Severe glucosuria was present. There was an enlarged thymus. The diagnosis of glucosuria of hypophyseal origin is given. Hyperactivity of adrenal function is also admitted as a possibility.—F. S. H.

(HYPOPHYSIS) A case of acromegalic gigantism (Sobre un case de gigantismo acromegalico). Flôres (N.) & Dias (A.), Rev. dos Cursos de la Fac. de med. (Porto Alegre, Brazil), 1921, **7**, 159-174.

This article can not be too highly praised for its completeness in description and the manner of presentation. It is well illustrated with splendid photographs and reproductions of the x-ray pictures. The case described is one of typical acromegalic gigantism.—F. S. H.

HYPOPHYSEAL syndromes of gestation. Acromegaly of pregnancy (Syndromes hypophysaires et gestation. Acromegalie gravidique). Fruhinsholz (A.), Rev. méd. de l'est (Paris & Nancy), 1922, **50**, 255-264.

A case report of a woman who, during pregnancy, developed the syndrome of a mild but typical acromegalic condition which receded after delivery and nursing.—F. S. H.

The rôle of the HYPOPHYSIS and of the brain in the production of cutaneous alterations in the toad (Le rôle de l'hypophyse et du cerveau dans la production des altérations cutanées chez le crapaud). Giusti (H.) & Houssay (B. A.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1112-1113.

Extirpation of the hypophysis in the toad, Bufo marinus (L.), produces an intense and curious alteration of the skin. The operations, which were through the mouth, caused in all cases a bronzing or blackening of the skin commencing 4 to 5 days after operation (in the spring), later in winter (8 to 15 days). Daily ingestion or injection of hypophyseal extract did not prevent it. In the spring there was an expulsion of eggs from the females, which was thought to be due to injury of the perihypophyseal zone.—T. C. B.

(HYPOPHYSIS) Acromegaly and lymphatic leukemia. Goldstein (H. I.), Am. Physician (Rahway, N. J.), 1922, **27**, 286-288.

A case of acromegaly with lymphatic leukemia that has been under observation for over ten years, is reported by the author. The unusual features of the case are the absence of pressure symptoms or "neighborhood symptoms," the loss of sexual power, for a period of six years or more, followed recently, for the past two and a half years, by a return of all sexual power, desire, and function; the occurrence of lymphatic leukemia, with splenomegaly and lymphomegaly for the past sixteen months. Improvement followed Roentgen-ray treatment to the **spleen**, lymph glands, **pituitary** and long bones. No other case of acromegaly has been found recorded in the literature, associated with leukemia, and such large sella turcica and without ocular disturbances, or any pathological changes in the eyegrounds, and with a normal basal metabolic rate.

—Quoted from original.

(HYPOPHYSIS) The oral administration of pituitary extract. Hamill (P.), Proc. Roy. Soc. Med. (Lond.), 1921, **14**, 17-19.

Though **thyroid** extract administered by mouth is known to produce definite results, such is not the case with most other incretory gland products. In a series of experiments carried out on cats, Hamill found that solutions of pituitary extract administered by mouth resulted in characteristic reactions. It was observed that absorption takes place from the stomach and is more rapid when

the organ is full and actively digesting. Moderate doses produce the usual uterine contractions; large doses give rise to colicky contractions of the intestines, and vomiting. The author concludes that pituitary extract orally administered to human beings is of definite clinical use and should be administered in solution on a full stomach.—I. B.

HYPOPHYSIS and carbohydrate metabolism (Hypophyse et métabolisme hydrocarbone). Houssay (B. A.), Hug (E.) & Malamud (T.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1115-1116.

All experiments were on dogs. After a lengthy study of the relation of the hypophysis to carbohydrate metabolism, the following conclusions are given. There is often glycosuria, not intense during the first days following extirpation of the hypophysis, piqûre, or a lesion of the neighboring cerebral zone. Dogs with the hypophysis extirpated, or with a lesion of the neighboring zone generally have a normal tolerance for the injection of sugar; but some dogs with marked adiposo-genital dystrophy tolerate large doses of sugar. In testing the tolerance by slow intravenous injection hyperglycemia curves are similar in hypophysectomized and control animals. Glycémia and the percentage of glycogen in the muscles and liver are normal in hypophysectomized animals.—T. C. B.

(HYPOPHYSIS) Normal and abnormal variations of the PITUITARY fossa. Howe (H. S.), Neurol. Bull. Columbia University, 1919, **2**, 233-238.

Howe has measured and made tracings of the pituitary fossae of forty normal skulls and has found that this fossa is normally subject to great variations both in size and outline. Radiograms, therefore, give no information of the condition of the pituitary gland unless the sellar enlargement or the amount of absorption of the bone is very great. He figures normal fossae showing all degrees of openness, of depth, and of width. He points out that although the anterior clinoid processes, as seen on an x-ray plate, seem to form the anterior portion of the sella, this is an artefact of projection; the true anterior superior boundary is the tuberculum sellae. In acromegaly there may be (1) no change in the size or outline of the sella; (2) general enlargement of the sellar space without erosion or absorption of bone; or (3) enlargement with absorption of all or part of the bony envelope. The normal hypophysis about fills the pituitary fossa transversely but not anteroposteriorly, so that there is room for some enlargement, by pressure on the circular venous sinus, before the bony cavity is filled. It is frequently found in acromegaly that the fossa has been enlarged by the absorption of bone. The floor of the sella or its anterior or posterior wall is affected before the tips of the posterior clinoid processes or the top of the dorsum sellae. Supra-tentorial tumors and conditions

causing chronic increase of intracranial pressure may induce absorption of the posterior clinoid processes.—Med. Sc., **6**, 488-489.

An experimental study of the PANCREAS and HYPOPHYSIS interrelationship (Pankreas und Hypophyse. Eine tierexperimentelle Studie). Kraus (E. J.), Beitr. z. path. Anat. u. z. allg. Path. (Jena), 1921, **68**, 258-277.

In an earlier paper (Virchow's Arch. f. path. Anat. [etc.], 1920, **228**, 68), the author described the anatomical changes in the human hypophysis in cases of **diabetes mellitus.** These changes were characterized by a noteworthy reduction in the size of the anterior lobe of the pituitary with great reduction in the number of acidophilic cells. The present communication deals with his efforts to reproduce these hypophyseal changes in cats by complete and partial removal of the pancreas. Eighteen partially or completely depancreatized cats and ten controls were studied. He found a distinct decrease in the size of the anterior lobe and in the number of acidophilic cells in the depancreatized animals. Atrophic changes were also noted in the intermediate and posterior lobes. He also observed morphological evidence of increased **thyroid** activity following pancreatectomy. This is an acute reaction, and if the animals survive some weeks definite atrophic changes supervene. He noted also a definite decrease in the lipoid material of the **suprarenal** cortex and the chromaffin reaction of the medulla. In the **testes** atrophy of the tubules with cessation of spermatogenesis and regressive changes in the nuclei of the interstitial cells was observed. There were atrophic changes in the **pineal** gland, while the **parathyroids** showed no definite changes.—D. M.

The influence of the HYPOPHYSIS upon the tonicity of the capillaries (Sur l'influence de l'hypophyse sur la tonicité des capillaires). Krogh (A.) & Rehberg (P. B.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 461-463.

Krogh and Harrop have demonstrated in the blood of mammals a substance which is capable of maintaining the tonicity of the capillaries in the interdigital membrane of the frog. It can be extracted by dialysis, resists boiling for a short time, is insoluble in alcohol, and is precipitated by phosphotungstic acid. It is said that extirpation of the hypophysis may produce subcutaneous edema. The authors find that removal of the hypophysis or of the "lobe intermediaire" induces characteristic alterations in the capillary activity of the skin. The capillaries relax, while the arteries undergo no alteration. This lasts for days or weeks and is followed by a failure of vasomotor equilibrium. There is extreme contraction of arteries and capillaries, alternating at intervals with normal dilatation of the arteries and extreme dilatation of the capillaries. By perfusion of the hind legs with a suspension of washed beef corpuscles

in Ringer-gum solution insotonic with frog's blood, the circulation is rendered visible. The perfusion is made rhythmic by a special apparatus to be described later, and the normal systolic pressure is maintained. The perfusion of Ringer-gum solution is soon followed by such an alteration in the permeability of the capillaries that there is extravasation even of the colloids. If pituitrin (P. D. & Co.), is added, 1:10,000, the contraction of the capillaries and arteries is so marked that the circulation is reduced to a minimum, or completely arrested. Pituitrin 1:50,000 and up to 1:500,000 is without effect on the arteries, but maintains the normal contractility of the capillaries. These reactions are analogous to those of the constrictor substance obtained from mammalian blood; pituitrin is dialysable, is precipitated by phosphotungstic acid, resists heat, and is insoluble in alcohol; and the conclusion is drawn that the hypophysis constantly secretes a substance which circulates in a low concentration and maintains the tonicity of the capillaries.—T. C. B.

(HYPOPHYSIS) Pituitary disorders in their relation to acromegaly (hyper-pituitarism), with suggestions for the use of a more precise terminology. Krumbhaar (E. B.), Arch. Diagn. (N. Y.), 1922, **14**, 213-239.

An illustrated histo-pathological study of acromegaly. The results lead to the theory that acromegaly is due to (or at least follows) hyperfunction of the anterior lobe, after ossification of the epiphyses, as expressed by an increase in acidophile cells. The acidophile increase may be expressed either as a hyperplasia of the normal lobe or as an adenoma. After the development of acromegaly the pituitary lesion may undergo cystic degeneration, so that lesions of this nature do not necessarily contradict the theory. Pituitary tumors may exist for many months even to the extent of destroying both lobes, without giving obvious signs of so-called pituitary disease. It is probable, however, that in most, or all, of these cases careful functional tests would reveal a latent disorder. The author recommends the following terminology which is self-explanatory: hyper-pre-pituitarism, hypo-pre-pituitarism, hyper-post-pituitarism, hypo-post-pituitarism and dispituitarism.—F. S. H.

(HYPOPHYSIS) ACROMEGALY and infantile gigantism in childhood (Ein Beitrag zur Akromegalie und zum infantilen Riesenwuchs im Kindesalter). Kundratitz (K.), Jahrb. f. Kinderh. (Berlin), 1922, **98**, 292-298.

A review of the literature dealing with the different roles of the hypophysis and the gonads in the development of cases of acromegaly and infantile gigantism. Both conditions may be present either alone or in combination. The author describes a boy of 10, 142 cm. in height and weighing 39 kg. that showed characteristics of both conditions.—C. H. G.

(DIABETES) Renal glycosuria. Lewis (D. S.), Arch. Int. Med. (Chicago), 1922, **29**, 418-427.

The four cardinal points in diagnosis are (a) glycosuria without hyperglycemia; (b) little, if any relationship between the carbohydrate intake and the amount of glucose excreted in the urine; (c) the absence of the signs and symptoms of **diabetes mellitus**, and (d) a long period of observation during which the patient shows no tendency to develop diabetes mellitus. In this paper one case is reported which fulfills all of the four requirements (having been observed for six years), and two cases are reported which answer the first three tests (having been observed for twelve months and fifteen months, respectively). The first case is of unknown origin; the blood sugar curve is of a strictly normal order. The second and third cases belong in the other group associated with chronic diffuse nephritis or anteriosclerosis, in which the patient shows a remarkably high and prolonged rise in the blood sugar, which is probably a retention phenomenon or perhaps connected with the high diastatic activity of the blood so often seen in severe nephritis.—H. L.

HYPOPHYSEAL origin and treatment of two cases of idiopathic DIABETES INSIPIDUS of familiar form (Sobre dos casos de diabetes insipida idiopatica de forma familiar y su tratamiento por el principio hipofisairio). Martinez (G. N.) & Navarro (A.), Rev. del Circulo med. de Cordoba, 1922, **10**, 78.

Two cases of diabetes insipidus are reported in father and son in a family in which there were other cases. The author believes that one cannot dispute the hypophyseal origin of this disease.

—B. A. H.

Polyurie HYPOPHYSAIRE. Minet (J.) & Auguste, Réunion méd.-chir. des hop. de Lille, 1922, July 27; abst., Presse méd. (Par.), 1922, **30**, 684.

The authors observed a man in poor general health and with **diabetes insipidus**, in whom only one injection of 0.10 gm. of hypophyseal extract was sufficient definitely to bring the urine output to normal. The authors believe that the trouble was due to a relatively slight disturbance of the hypophyseal function caused by general nutritional disorders.—R. G. H.

HYPOPHYSEAL dwarfism. Marañón (G.) & Solanilla (L.), Arch. españ. de. pediat. (Madrid), 1921, **5**, 467, abst., Monatschr. f. Kinderh. (Leipz.), 1922, **23**, 231.

Description of a characteristic case of dystrophia adiposogenitalis with dwarfism. Roentgenographically there was shown defective development of the metacarpals and a small sella turcica. Organotherapy was tried without result. The condition was referred to a sclerosis of the anterior lobe of the pituitary which was related to tuberculosis in the mother.—C. H. G.

(HYPOPHYSIS) PITUITARY gland therapy. Ohler (W. R.) Boston M. & S. J., 1922, **187**, 173-174.

This is a short statement of the manifestations of dispituitarism, followed by a plea for more careful observation of the results of treatment with pituitary substance. There are no new data.

—J. C. D.

(HYPOPHYSIS) A case of acromegaly and gigantism with mental troubles (Un cas d'acromegalogigantisme avec troubles mentaux). Parhon (C.) & Stocker (A.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1920, **2**, 2-4.

The mental disturbance accompanying the acromegaly was emotional neurasthenia.—F. S. H.

The functional value of the HYPOPHYSIS and the clinical means of evaluation (La valeur fonctionelle de l'hypophyse et les moyens cliniques de l'évaluer). Parisot (J.) & Richard (G.), Rev. méd. de l'est (Paris & Nancy), 1922, **50**, 279-285.

A review with no new data.—F. S. H.

Action of HYPOPHYSIN (Parke Davis's pituitrin) on the rabbit's pupil. Pollock (W. B. I.), Brit. J. Ophth. (Lond.), 1920, **4**, 106-124.

Instilled into the eye, midriasis occurred in 94% of cases; this effect is increased by "decentralization," and still more by "deganglionation," of either the sphincter pupillæ or the dilator iridis, or better still of both. Given intravenously, the local effect may be overlooked if counteracted by a rise of blood-pressure or excitation of the 3rd nerve. If that nerve is cut, dilatation of the pupil by pituitrin (intravenously) is marked and immediate. It is considered that the drug, like **adrenaline**, acts on the myoneural junction.

—Physiol. Abst., **5**, 248.

Radium and x-ray in tumors of the HYPOPHYSIS. Quick (D.), Arch. Ophth. (N. Y.), 1920, **49**, 256.

The author points out that examination with the ophthalmoscope and x-rays is usually conclusive and that the latter is particularly useful when bony destruction is noted. The pathology of tumours of the hypophysis is shortly dealt with. A review of surgery on these types of cases and of the results follows, from which the author concludes that it is far from being the ideal form of treatment. The results of treatment by many radiologists are given; in every case there was some improvement in the symptoms by using radium and x-ray either together or separately. The author then describes three cases that came under his personal notice and the procedure of treatment. Radium alone was used, and the author thinks that possibly this was a mistake. He points out that if the

patient be suffering from coryza or any nasal infection there is danger of death from meningitis. Three points are put forward in favor of radiological treatment: (1) there is no operative mortality; (2) pressure symptoms respond much more promptly and more uniformly and without pain or inconvenience; (3) it offers hope of benefit to every type of case except perhaps simple cysts, whereas the scope of surgery is limited. Other reasons for employing radiotherapy are also dealt with, and the advantages and disadvantages of x-rays and radium are discussed. On the whole the author favors the application of radium after a submucous resection of the septum nasi and possibly the removal of a window from the floor of the sella turcica so as to expose the gland directly.—Med. Sc. **6**, 433-434.

A method for the study of the human HYPOPHYSIS cerebri, with illustrative results. Rasmussen (A. T.) & Herrick (Ruth), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 416-423.

Report of the determination of the relative and absolute weights of the three principle parts of the main body of the hypophysis, together with the relative number and arrangement of the three types of cells in pars anterior of normal adult males between 20 and 60 years of age. The large colloid masses were included in the study. Post-mortem material was used and fixed in ordinary formalin. The results are given in a table, the details of which cannot be abstracted.—F. S. H.

(HYPOPHYSIS) Traumatic lesions of the pituitary body. Reverchon (L.) & Worms (G.), Bull. et mém. Soc. de chir. de Par., 1921.

The authors give details of a case of fractured base of the skull. The patient was under observation for several months with bilateral paralysis of the fifth, sixth and seventh cranial nerves and with signs of a pituitary lesion. Autopsy revealed a pituitary gland which was reduced to a mere nodule and was surrounded by a dense capsule of fibrous tissue. The pituitary symptoms were polydipsia, polyuria, marked anemia and asthenia, arterial hypotension and a psychical state of puerility and apathy. Lesions of the pituitary gland should henceforth find a place in the complications of basal fracture.
—Med. J. Australia, 1921, **ii**, 86.

Danger of HYPOPHYSIS extracts (A propos du danger des extraits d' hypophyse). Riehl, Bull. Soc. d'obst. et de gynéc. de Par., 1922, **11**, 396-403.

Supports the belief of Doederlein that **pituitary** extracts should be used in labor with caution and only towards the end of the period of dilatation or period of expulsion, and only when parturition is sufficiently advanced to make possible instrumental interference if necessary.—F. S. H.

(HYPOPHYSIS) Discussion of the report of Le Lorier on the subject of the use of sublimate and PITUITARY extracts by midwives

(Discussion du rapport de M. Le Lorier: au sujet de l' emploi du sublimé et des extraits hypophysaires par les sages-femmes). Rouvier, Pouget & Laffont, Bull. Soc. d'obst. et de gynéc. de Par., 1922, **11**, 162-163.

The prevention of the use of pituitary extracts by midwives was recommended.—F. S. H.

(HYPOPHYSIS) Rupture of uterus at term following an injection of PITUITARY extract (Rupture d' un utérus à terme à la suite d' une injection d' extrait hypophysaire). Séjournet & Braine, Gynécologie (Par.), 1922, **21**, 271-283; Bull. d'obst. et. gynéc. de Par., 1922, **11**, 234-237.

A case description with no conclusion. The patient recovered. —F. S. H.

Action of extracts of the HYPOPHYSIS, the THYROID and the SPLEEN, injected into the lateral ventricles of the brain (Action produite par les extraits d'hypophyse, de thyroïde et de rate injectés dans les ventricules lateraux du cerveau). Stern (L.), Battelli (F.) & Jauffret (J.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 753-754.

Fresh aqueous extracts of the glands were injected into the lateral ventricle of the dog and the guinea pig. In general the results were analogous in the two species. The amount injected varied with the size of the animal. Extract of the posterior lobe of the beef pituitary generally had no immediate effect. Occasionally there was a slight phase of excitation in the guinea pig. After a time there developed a state of somnolence which augmented little by little, lasted several hours and then the animal gradually recovered its normal condition. In the guinea pig there was diminution of body temperature, but there was no appreciable change in the dog. There was slight glycosuria in the guinea pig. Extracts of the anterior lobe of the hypophysis produced no appreciable effect. Extract of spleen immediately produced a state of excitation with violent muscular contractions, subsultus, etc. This condition was rapidly succeeded by a state of prostration with muscular feebleness, and slight paralysis. There were no significant changes in temperature. In the dog there was an abundant secretion of watery saliva. The effects of extract of muscle were analogous to those of the spleen. Extract of thyroid was inconsistent in effects. Sometimes there was violent agitation, sometimes no effect; in some elevation of temperature, in others slight diminution was seen. —T. C. B.

The HYPOPHYSIS in mental diseases (L'hypophyse dans les maladies mentales). Stocker (Alice), Bull. et mém. Soc. neurol., psychiat. et psychol de Jassy, 1921, **2**, 124-131.

Series of cursory observations.—F. S. H.

HYPOPHYSEAL cyanophilia in epilepsy (La cyanophilie hypophysaire dans l'epilepsie). Stocker (Alice), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 70-77.

Histological studies of the hypophyses of individuals who have had epilepsy showed a marked constancy in the occurrence of a multiplication of the cyanophile elements of the epithelial lobe.
—F. S. H.

(HYPOPHYSIS) The so-called permanent polyuria of experimental DIABETES INSIPIDUS. Towne (E. B.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 306-308.

An incision was made through the tuber cinereum which opened the third ventricle and completely separated the stalk and gland from the base of the brain. One dog was used. The resulting polyuria lasted for a few weeks and then the urinary output returned markedly towards normal. At autopsy there was a marked increase in adipose tissue. The uterus and ovaries were infantile. The thyroid and adrenals were microscopically normal. The ovaries showed ova in every stage of development. The results indicate that a stalk division high enough to detach all epithelium from the base of the brain does not necessarily result in a permanent polyuria.—F. S. H.

PITUITRIN as a muscular tonic (La pituitrine comme tonique musculaire: étude ergographique). Urechia (C. J.) & Groff (F.), Ann. de méd. (Par.), 1922, **12**, 64-69.

Pituitrin was injected into 13 subjects in doses ranging from 1 to 5 ctg. and the muscular capacity determined by the ergograph. It was found that the ability to work was increased. The drug also tends to inhibit hypersomnia and has a favorable effect on the asthenia of Parkinson's disease.—F. S. H.

(HYPOPHYSIS) Diffuse painful adiposity accompanied by changes in the sella turcica (Adipose douloureuse avec modifications de la sella turcique). Vallery-Radot (P.) & Dollfus (M. A.), Bull. et mém. Soc. méd. d. hôp. de Par., 1922, **46**, 1016-1022.

A case report with no unusual data.—F. S. H.

Exaggeration of carbohydrate tolerance, and absence of reaction to extract of posterior lobe of the HYPOPHYSIS in a case of ACROMEGALY (Exagération de la tolérance aux hydrates de carbone et absence de réaction à l'extrait de lobe postérieur de l'hypophyse chez une acromégalique). Verger (H.), Massias (C.) & Auriat (G.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 197-198.

The subject was a woman of 36 with epileptic crises for 13 years with hirsutism, and a modified acromegaly limited to the face, the hands and feet remaining normal. Radiography showed

enlargement of the sella turcica. There was no adiposity, no augmentation of height, no genital disturbance, no polyuria, and no glycosuria. The sugar tolerance was tested by giving increasing amounts, beginning with 50 gms., and running up to 300 gms. in 6 days. There was no glycosuria even after the intramuscular injection of 0.2 gm. of posterior lobe extract. It would seem to be a complex case of bilobular dysfunction of the hypophysis, the anterior lobe causing an acromegalic syndrome, the posterior lobe, an exaggerated carbohydrate tolerance and absence of reaction to its extracts. —T. C. B.

(HYPOPHYSIS) Glycosuria in pregnancy. Wallis (R. L. M.) & Bose (J. P.), J. Obst. & Gynæc. Brit. Emp. (Lond.), 1922, **29**, 274-296.

There are 2 types of glycosuria met with in pregnancy, viz.: (a) intermittent or transitory glycosuria; (b) severe glycosuria and true **diabetes mellitus.** The former shows certain characteristic features, and may be diagnosed by means of blood and urinary analysis, and the glucose tolerance test. A new method of estimation of sugar in the urine in normal and abnormal amounts is described, and the value of this method in cases of glycosuria in pregnancy is emphasized. By means of the glucose tolerance test it is possible to correlate the occurrence of intermittent glycosuria of pregnancy with hyperactivity of the pituitary body. The application of blood and urinary analysis to cases of glycosuria in pregnancy renders it possible to differentiate between the 2 types. The importance of differential diagnosis is emphasized by the fact that the treatment of the 2 conditions is totally different, the intermittent or transitory type requiring little, if any, dietetic treatment.—E. N.

Histological study of the HYPOPHYSIS during gestation (Étude histologique de l'hypophyse au cours de la gestation). Watrin (J.), Rev. méd. de l'est (Paris & Nancy), 1922, **50**, 250-254.

Studies on various animals which confirm earlier findings by other workers that the hypophyseal reaction to pregnancy is marked. The main source of the weight increase is an anterior lobe enlargement.—F. S. H.

(HYPOPHYSIS) The neurohypophysis (Considerations sur la neurohypophyse). Watrin (J.) & Baudot (J.), Rev. méd. de l'est (Paris & Nancy), 1922, **50**, 265-270.

Nervous, ependymal and vascular elements are found in the neurohypophysis in addition to the pigmentophore, lymphoid and wandering cells. A review of the known data is given.—F. S. H.

Notes on three cases of dyspituitarism: HYPOPHYSEAL infantilism. Webster (W. L.), J. Roy. Army Med. Corps (Lond.), 1922, **39**, 59-64.

Three cases (males of 22, 19 and 25 years) of the Lorain type of pituitary infantilism, all infantile, but perfectly proportioned, having the appearance of normal boys of 10 years, show bones thin, short, and not united, a degree of mental enfeeblement, and all suffer from periodic fits. The first shows complete double optic atrophy and a severe degree of mental impairment; the second has only the mentality of his apparent age. Radioscopy in the first showed the clinoid processes mostly absorbed, and the sella turcica shallow and enlarged in the anterior-posterior direction. Opaque shadows in the frontal region suggest an extensive growth, an exostosis of the bone or a very slow growing tumor with much calcareous deposit. Radioscopy in the second showed a normal sella turcica. Treatment with anterior lobe of pituitary led to no improvement in any of these cases.—A. T. C.

(HYPOPHYSIS) Studies in DIABETES INSIPIDUS, water balance and water intoxication. Weir (J. F.), Larson (E. E.) & Rowntree (L. G.), Arch. Int. Med. (Chicago), 1922, **29**, 306-330.

Fifteen cases of diabetes insipidus were studied. One patient had a supratentorial brain tumor, another a hypophyseal tumor, four had syphilis; in nine cases no causative factor could be determined. Antisyphilitic treatment had no significant effect on the diabetes insipidus in the four syphilitics. The symptom of thirst is not due to dryness of the oral mucous membranes, because cocainization of the mouth and nasopharynx had no effect on the polydipsia and polyuria. Careful studies of renal function failed to incriminate any part of the urinary tract as an etiologic factor and revealed no deviations from normal function. All fifteen cases responded promptly and beneficially to injections of posterior lobe pituitary; the effect lasted from a few hours to four or five days. The volume of saliva increased definitely, the skin became moist, thirst markedly diminished, etc. Injections of histamine gave no relief whatever (tried in three cases). Spinal puncture in nine cases was without any effect. Restriction of fluids should not be tried. The intense suffering inflicted is out of all proportion to the slight benefit obtained. Metabolic studies before and after the administration of pituitary extract were made in two cases. The subcutaneous injection of 1 cc. pituitary extract in 5 normal men, carefully controlled, produced no appreciable effect on the urinary excretion. Pituitary extract was administered subcutaneously to dogs before and after section of the splanchnic nerves to both kidneys. Diuresis was prevented independent of the nerve supply of the kidney. This antidiuretic effect the authors are unable to explain. The renal threshold for water was not increased, nor could hydremic plethora be demonstrated. A water intoxication, consisting of headache, nausea and vomiting was produced in three patients by ingesting large amounts of water after an injection of pituitary extract. The same result was produced experimentally in dogs. The animals became

very drowsy, and later showed muscular twitching and ataxia, and finally convulsions and coma.—H. L.

HYPOPHYSEAL nanism (Hypophysärer Zwergwuchs). Witthauer, Deutsche med. Wchnschr. (Berl.), 1922, **48**, 1025.

Demonstration of a dwarf of 24 with dystrophia adiposogenitalis. The sella was very large. No other details are given. —J. K.

The PARATHYROIDS. Bergstrand (H.), Nord. med. Ark. (Stockholm), 1920, **53**, 791-856.

Mainly anatomical. The Bielchowsky method of staining is recommended for parathyroid tissue. Only one cellular type of functional value was found. Welch's cell is a degeneration product. Colloid material was found which is either a true secretion or a product of the breakdown of the Welch cell.—R. G. H.

A case of TETANY in a growing boy, together with some critical remarks on the pathogenesis of tetany (Ein Fall von Tetanie bei einem Erwachsenen nebst einigen kritischen Bermerkungen hinsichtlich der Pathogenese der Tetanie). Bolten (G. C.), Monatschr. f. Psychiat. u. Neurol. (Berl.), 1917, **42**, 211-236.

A description of a classical case of tetany. The tetany was probably of **parathyroid** origin largely since dentition was faulty and cataract was present. A general pluriglandular disturbance was also suspected. The Wassermann reaction was positive. After reviewing the literature of similar cases and discussing them, Bolten concludes that all cases of tetany cannot be considered as of parathyroid origin or that the tetany poison is always the same.—F. S. H.

Epilepsie und TETANIE. Bolten (G. C.), Deutsche Ztschr. f. Nervenh. (Leipz.), 1917, **57**, 160-202.

Epilepsy is classified under four headings: (a) cerebral epilepsy, (b) epilepsy due to endogenous intoxications (c) epilepsy due to exogenous intoxications, and (d) genuine epilepsy due to **thyroid** and **parathyroid** insufficiency. In the last group there is placed infantile tetany, spasmophilia, post-operative tetany after strumectomy and induced tetany in animals. A good review of the subject given in the title accompanied by many references.—F. S. H.

Reticular apparatus of Golgi and secretory polarity of the PARATHYROID cells (Appareil réticulé de Golgi et polarité sécrétoire des cellules parathyroïdiennes). Courrier (R.) & Reiss (P.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 867-868.

Histological.—T. C. B.

A case with symptoms of paralysis agitans with excessive calcium output in the urine—improvement under PARATHYROID treat-

ment. Dercum (F. X.), J. Nerv. & Ment. Dis. (N. Y.), 1918, **47**, 368.

The author reports a case of a married woman of 57 who presented symptoms suggesting early paralysis agitans. The symptoms had been present a year and included fixed facial expression and a tendency to hold fixed positions of the hands and body. Laboratory findings were negative except for an excessive output of calcium in the urine—0.532 gms. Under the administration of parathyroid extract, 1/20 grain three times daily, the symptoms improved markedly and within a month had completely disappeared. The calcium output in the urine continued over 0.5 gm. No blood calcium determinations were given. The improvement was attributed to the administration of the parathyroid extract, which did not seem to have any influence on the calcium output. Dr. Burr reported a series of about 13 cases of paralysis agitans treated with parathyroid with improvement in one case and no change in the remaining 12.

—F. H. A.

(PARATHYROID) TETANY, a report of cases with acid-base disturbance. Grant (S. B.), Arch. Int. Med. (Chicago), 1922, **30**, 355-361.

The occurrence of tetany in various disorders of the body is discussed. These disorders may be divided into two groups: (a) pyloric obstruction, hyperpnea and overdosage with sodium bicarbonate, which have in common a disturbance of the acid-base equilibrium, due to an increase in the ratio of sodium bicarbonate to carbonic acid in the blood; and (b) infantile tetany and parathyroid tetany, in which there is a calcium deficiency in the blood. Six cases of tetany in adults, all of the type in which there was an acid-base disturbance, are reported. Three cases occurred in obstruction of the stomach. In two of these the plasma carbon dioxide capacity was found greatly increased. In one, the blood chlorid was found markedly decreased. Serum calcium in this case was in the upper limits of normal. These results corroborate in man the experimal findings of investigators in animals. Two cases resulted from overdosage with sodium bicarbonate, and one occurred in hysterical hyperpnea.—H. L.

(PARATHYROID) The supposed relation between alkalosis and TETANY. Greenwald (I.), J. Biol. Chem. (Balt.), 1922, **54**, 285-304.

After a general discussion of the various theories of tetany, Greenwald presents the results and interpretations of his experiments with dogs, in which tetany was induced by the administration of sodium carbonate or bicarbonate. Analyses of the blood showed that after such injections there is a retention of carbon dioxide which is so great that the reaction is changed only slightly. When

convulsions appear the bicarbonate content of the blood and the alkalinity begin to diminish and this process continues so that before death both may be less than normal. The change is due in part to the increased production of lactic acid. The production of lactic acid appears to be increased before convulsions appear, but is enormously accelerated thereby. The concentration of sodium in the plasma at the time the convulsions appear is the same as that found when other sodium salts are administered, and hence the tetany is ascribed to a "sodium poisoning," a disturbance due to an excess of sodium, of the normal equilibrium between sodium and other ions. Parathyroid tetany is not an alkalosis.—F. S. H.

The metabolism of inorganic salts. I. The organic ion balance of the blood in PARATHYROID tetany. Gross (E. G.) & Underhill (F. P.), J. Biol. Chem. (Balt.), 1922, **54**, 105-120.

A series of decisive experiments were performed on dogs showing that the blood salts in these animals under normal fasting conditions are practically constant, that parathyroidectomy chiefly disturbs the ratio between calcium and potassium, and that the inception of tetany obtains with a definite change in the ratio of calcium to potassium. The hypothesis is suggested that both low calcium and high potassium are factors in the production of the increased irritability. (The suggestion that the disturbances in salt relationships in the blood are factors in the production of the increased irritabilty was made some tme ago by the abstracter.)—F. S. H.

The probable function of the PARATHYROID glands. Hammett (F. S.), N. York M. J. [etc.], 1922, **115**, 401-403.

The metabolism of muscle tone differs from that of muscle movement. Creatine, an important product of muscle tone, is relatively innocuous for the organism. Creatine is changed to creatinine by the loss of one molecule of water and is excreted in the urine. Creatine is acetylated methyl-guanidine. Methyl-guanidine is highly toxic and acts as an irritant to the nerve endings. Following parathyroidectomy methyl-guanidine accumulates from the existent condition of muscle tone. Hence, it is probable that the function of the parathyroid glands is the elaboration of a secretion which assists in the prevention of the accumulation in the organism of the toxic nerve irritant, methyl-guanidine, which normally is a by-product of that phase of muscle metabolism concerned in muscle tone. This conclusion is borne out by the finding that animals of high muscle tone succumb more rapidly to parathyroidectomy than those with low muscle tone. According to the author there is not sufficient clinical nor experimental evidence to warrant the assumption that paralysis agitans, epilepsy, eclampsia, gastric tetany and convulsive states are resultant conditions of parathyroid deficiency.—H. W.

Report of a case of PARATHYROID insufficiency. Hurst (A. F.), N. York M. J. [etc.], 1922, **115**, 403-404.

A case reported of a male, age 47, a clerk who had a goiter at 30, was operated upon in 1908 and was well until August, 1910. He suddenly became depressed, nervous and restless, slept little, walked the greater part of the night, was tremulous and had fibrillary twitching of eye lids. There was no evidence of tetany, nor of goiter. The patient lost weight. He had difficulty in swallowing, felt irregular intestinal pains, had a pulse of 120, and palpitation. His face and neck were flushed; his hair ceased to grow, but did not become thinner. He became impotent. There were 3 to 4 large stools a day. The urine was scanty; the sweat was unaffected. The patient was put to bed in December. He gradually lost in spite of forced feeding and rest. Large doses of morphin and bromides were administered. **Thyroid** preparations aggravated the condition. He returned to work in February. On Jan. 18 he was placed on 1/10 grains of parathyroid four times a day. He slept better, was less restless, tremor and dysphagia improved, hair began to grow, the amount of urine increased, the stools diminished in bulk, the pulse fell below normal, libido returned, and he gained weight. He was perfectly well for five years (1918), at the end of which time there was slight recurrence of symptoms. He was again placed on parathyroid medication, and became perfectly well and remained so up to the time of this report.—H. W.

(PARATHYROID) The pharmacology of guanidin (Beiträge zur pharmakologischen Wirkung des Guanidins). Klinger (R.), Arch. f. exper. Path. u. Pharmakol. (Leipz.), 1921, **90**, 129-141.

This is a study of the effects of guanidin and its methyl derivatives on cats and rats. In cats these substances cause an increase in the motor and psychic irritability beginning with unrest, twitching of the feet, and increasingly frequent convulsions of separate muscle groups up to strong general muscular spasms appearing at brief intervals. Salivation and maximal pupil dilatation appear, especially during seizures. The somewhat different symptoms are also described in the rat. There are two differences noted between the symptoms of guanidin intoxication and postoperative **tetany.** In the former there is a ready appetite for two or three days, the animal being kept from eating only by the convulsions. In the latter, on the other hand, one of the earliest and almost never failing symptoms is the loss of appetite and refusal of food. The second difference is the unlike efficacy of calcium salts. Amounts of these salts which cause an improvement in post-operative tetany are without effect in guanidin intoxication.—F. A. H.

PARATHYROID deficiency and its treatment. Lahey (F. H.), Boston M. & S. J., 1922, **187**, 170-173.

It is pointed out that the only proved form of parathyroid deficiency is that following the removal of these glands. The author, as the result of his own experience and that of others, concludes that calcium lactate by mouth is the most satisfactory method of controlling tetany following interference with the parathyroids. The use of preparations of the parathyroids have not met with success.
—J. C. D.

Habitual vomiting and TETANY (Vomissements habituels et tétanie). Lemaire (H.) & Olivier, Nourrisson (Par.), 1922, **10**, 302-312.

Not endocrine.—F. S. H.

The control and cure of PARATHYROID tetany in normal and pregnant animals. Luckhardt (A. B.) & Rosenbloom (P. J.), Science (N. Y.), 1922, n. s. **56**, 48-49.

These authors have found it possible to keep completely parathyroidectomized dogs alive even when fed a diet chiefly of meat by means of the intravenous injection of Ringer's solution. After maintaining this treatment for about 40 days no further injections are necessary if a moderate amount of meat is given and the animals do not become constipated. Pregnant dogs can be kept alive by similar treatment, but with more difficulty. It seems clear that tetany is caused by an exogenous poison derived chiefly from the proteins of the food, especially meat. One can precipitate an almost fatal attack of tetany 33 days after parathyroidectomy in 2 hours by feeding one-half pound of meat, especially if the latter is not fresh. None of the adult animals have shown signs of **myxedema** after seven months. The young animals born of and raised by parathyroidectomized mothers were perfectly healthy.—F. A. H.

The recurrence of acute PARATHYROID tetany in completely parathyroidectomized animals during the oestrous cycle. Luckhardt (A. B.) & Blumenstock (J.), Science (N. Y.), 1922, n. s. **56**, 257-258.

A report based upon two dogs from which all parathyroids had been removed several months previously. They had recovered from the early attacks of tetany and were in excellent health until the oestrous cycle. At this time severe tetany reappeared. It is suggested that the tetany which occurs in partially strumectomized women during menstruation is due to hypofunction or absence of parathyroids.—F. A. H.

Pathology of TETANY (Beiträge zur Klinik und Pathologie der Tetanie). Spiegel (E.) & Elias (H.), Wien. Arch. f. innere Med., 1921, **2**, 447.

Of no immediate endocrine interest.—F. S. H.

The influence of the sodium ion in the production of TETANY. Tisdall (F. F.), J. Biol. Chem. (Balt.), 1922, **54**, 34-41.

Not of immediate endocrine interest. It was concluded from the results of injecting phosphate solutions that the sodium-calcium ratio is the important factor in the production of tetany, with the exception of the gastric type. Gastric tetany is apparently due to an increase of the bicarbonate ion. No evidence has been found that the calcium-phosphorus ratio has any influence on the production of tetany.—F. S. H.

The effects of PROSTATE substance on the metamorphosis of the intestine of frog tadpoles. Hegner (R. W.) Am. J. Physiol. (Balt.), 1922, **61**, 298-299.

Bull frog and green frog tadpoles were fed desiccated ram's prostate and Macht's observations were confirmed. The prostate contains something that stimulates the differentiation of the intestine of bull frog and green frog tadpoles.—T. C. B.

Further observations on the effects of the subcutaneous injections of splenic extract. Downs (A. W.) & Eddy (N. B.), Am. J. Physiol. (Balt.), 1922, **62**, 242-247.

Confirmation of previous conclusions. Subcutaneous injections of "protein free" splenic extract causes a greater number of reticulated cells than normal in the circulating blood, the appearance of nucleated red corpuscles, and the resistance of the red corpuscles to extend over a wider range. The white corpuscles showed no change.—T. C. B.

The SPLEEN and digestion. Study II. The spleen and PANCREATIC secretion. Inlow (W. deP.), Am. J. M. Sc. (Phila.), 1922, **164**, 29-44.

In this paper the author presents data concerning the pancreatic secretion, before and after splenectomy, on 2 dogs with permanent pancreatic fistulas secreting an inactive proteolytic juice, and on 2 similar nonsplenectomized dogs serving as controls. Removal of the spleen caused no constant change in the amount, enzyme content, or alkalinity of the pancreatic juice. The author concludes from a review of the literature and his own experimental inquiry that a definite trypsinogenic function of the spleen has not been demonstrated.—J. F.

The SPLEEN and digestion. Study III. The spleen in inanition; the effect of the removal of the external secretion of the PANCREAS on the spleen. Inlow (W. deP.), Am. J. M. Sc. (Phila.), 1922, **164**, 173-188.

The data submitted in this paper seem to justify the conclusion that the spleen loses markedly in weight in inanition and out of

all proportion to the decrease in the body weight. The removal of the external function of the pancreas by ligation of its ducts or resection of a portion of the gland likewise leads to an excessive decrease in the size of the spleen. The shrinkage under these conditions, however, can be explained as due to the inanition and does not require the postulation of a specific pancreatic-splenic interrelationship.—J. F.

Increase of mitoses and of pyknoses in the THYMUS of the mouse after intraperitoneal injection of foreign serum (L'onde de cinèses et l'onde de pycnoses dans le thymus de la souris après injection intraperitonéale de sérum étranger). Dustin (A. P.), Compt. rend. Soc. de biol. (Par.), 1921, **85**, 260-261.

The author studied the number of pyknoses and the number of mitoses which could be found in the thymus during the day following an intraperitoneal injection of aseptic foreign serum. The curve of pyknoses and that of mitoses were exactly inverse, and followed a definite law.—Physiol. Abst.

(THYMUS) Death after tonsillotomy due to status thymolymphaticus (Fall von Exitus letalis nach Adenotomie bei Status thymolymphaticus). Feuchtinger, Wien. klin. Wchnschr., 1922, **35**, 679.

In a child of 3 years respiration stopped immediately after operation. Artificial respiration was tried, tracheotomy was performed, and respiration began again. Next day death occurred due to paralysis of the heart. Postmortem examination showed a large thymus and enormous hypertrophy of both ventricles of the heart.
—J. K.

New views as to the morphology of the THYMUS gland and their bearing on the problem of the function of the THYMUS. Hammar (J. A.), Upsala Läkaref. Förh., 1922, **27**, 147-221.

Reprinted from Endocrin., **5**, 543-573; 731-760.—R. G. H.

A basic peptone-like compound in the THYMUS (Ueber ein basischen pepitonahnlichen Korper in der Thymusdrüse). Kiesel (A.), Ztschr. f. physiol. Chem. (Berlin u. Leipz.), 1922, **120**, 91-93.

Not of endocrine interest.—F. S. H.

(THYMUS) Sudden death in status thymico-lymphaticus (Zur Erklärung der plötzlichen Todesfälle bein Status thymo-lymphaticus). Ryser (H.), Schweiz. med. Wchnschr. (Basel), 1921, **51**, 554-557.

A brief review of the current theories on the subject. The author is inclined to place the blame upon an endocrine disturbance, though not necessarily of any one gland.—F. S. H.

The significance of the persistent THYMUS (Die Bedeutung der Thymus persistens). Yamanoi (S.), Schweiz. med. Wchnschr. (Basel), 1921, **51**, 557-560.

Three hundred and three individuals who had died of acute grippe were examined for the presence of persistent thymus. The ages ranged from 25 to 50 years. Both sexes were investigated. There was found a persistent thymus in 24.4% of the group. The cases were not complicated with status thymico-lymphaticus. From the 25th to the 35th years the per cent of persistent thymi was 29.4; from the 36th to the 50th year it was 14.1. Because of the supposed correlation between thyroid and thymus, observations were also made on the former organ. There was found an enlarged thyroid in 73.9% of the group. In 77.0% of the cases where there was a persistent thymus there was also found an enlarged thyroid. Another smaller series showed 33.3% of persistent thymi.—F. S. H.

Phosphorus and ash content of the human THYMUS (Zur la teneur en phosphore et en cendres du thymus). Zunz (E.), Compt. rend. Soc. de biol. (Par.), 1920, **83**, 647-648; abst., Physiol. Abst., 1920, **5**, 191.

Analyses were made of the thymus obtained from 44 men (age 19 to 34 years) killed in the war. The gland was first extracted with ether. The P ranged from 0.03 gm. to 0.31 gm. av. 0.1 gm., or from 2.62% to 4.50%, av. 3.57 %, of the dry thymus. The ash content ranged from 3.59% to 8.69%, av. 6.7%, of the dry gland. The ratio N:P was 2.80 to 6.61, av. 4.01. The per cent of ether extract tended to increase with the age of the subject. This age relationship did not exist for total solids (20.49%), total N (13.65% of the dry residue), P, and ash; the chemical composition of the gland did not vary with the age of the normal adult. Each gram of fresh thymus with its fat contained from 0.62 mgm. to 1.61 mgm., av. 1.09 mgm., of lipin P; if this lipin P exists only in the thymus proper, its amount would then range from 0.80 mgm. to 1.82 mgm., av. 1.32 mgm.; these values are intermediate between those for the liver and the kidney. In the adults studied, the entire thymus contained from 5.5 mgm. to 39.59 mgm., av. 17.47 mgm., of lipin P.—Chem. Abst., **15**, 2482.

(THYROID) The syndrome of Basedow's disease (Le syndrome basedowien). Achard (C.), Progrès méd. (Par.), 1922, **37**, 229-233; 265-268; 277-283.

A general discussion.—F. S. H.

(THYROID) The Basedowian syndrome (Le syndrome basedowien). Achard (C.), Progrès méd. (Par.), 1922, **37**, 241-244.

In this section of the general review of the disease under discussion there is taken up the general symptoms and the disturbances

of nutrition. The position is taken that at times discordant results of various observers are probably due to the complexity of the disorganization, which is not only attributable to the thyroid, but also to an insufficiency of several organs.—F. S. H.

(THYROID) The syndrome of Basedow's disease (Le syndrome basedowien). Achard (C.), Progrès méd. (Par.), 1922, **37**, 289-292.

The last of a series of articles in which a general discussion of Basedow's disease has been reported. This one has to do with the therapeutics of the disorder. Hygiene, physiotherapy, opotherapy and x-ray or radium treatment are severally considered. Achard stresses the point that the cause of the disorder should be sought for and treated as well as the condition itself. Syphilis as a causative factor occurs in some cases; tuberculous thyroiditis is another; acute rheumatism another. The use of salicylates is indicated in Basedow's disease and particularly in disorders arising from the latter cause. Basedow's disease is not considered as a true entity since it is not distinguished by a specific cause peculiar to the disorder. In other words, Basedow's disease is an ensemble of symptoms, hence a syndrome. The principal disturbances of the syndrome are those arising from sympathetic excitation.—F. S. H.

THYROID therapy. Allison (R. G.), Minnesota Med. (St. Paul), 1922, **5**, 404-409.

Of 27 cases of exophthalmic goiter without complications which were subjected to roentgen-ray treatment by Allison, 24 patients are well, both from the clinical and laboratory standpoint. The treatment has been complete for nearly 8 months. The remaining 3 cases came to operation. Of these 3, one was definitely improved before operation and the other 2 were normal a few months after operation. Of 6 cases of postoperative hyperthyroidism, which had relapsed, one showed a definite cure. The other 5 showed no improvement. Of 3 cases of thyrotoxic adenoma none showed any response to roentgen-ray therapy. The only patient operated on during an increasing basal metabolic rate died an operative death. No bad results or complications have occurred.—J. Am. M. Ass., **79**, 682.

Studies on the mechanism of the increased metabolism in HYPERTHYROIDISM. Aub (J. C.), Bright (E. M.) & Uridil (J.), Am. J. Physiol. (Balt.), 1922, **61**, 300-310.

Good evidence of the mechanism by which the active principle of the thyroid exerts its influence on metabolism is scanty and the present experiments were made to study further the increased heat production after thyroid injections, to see whether muscular movements, tonus, or adrenal secretion could be its cause. The usual methods were employed and the results charted. It is concluded that increased basal metabolism stimulated by thyroxin cannot be

explained by muscular activity, muscular fibrillation or increased muscle tonus. The adrenals are not essential. The findings support the theory that thyroxin stimulates resting cells directly to a higher level of combustion.—T. C. B.

Self observation of a case of migraine cured by THYROID treatment (Auto-observation d'un cas de migraine guéri par le traitement thyroïdien). Ballif (Charlotte), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 21-23.

The author takes occasion to record her cure of migraine by the ingestion of thyroid substance tablets to tolerance.—F. S. H.

Factors influencing the rate of mortality in surgery of the THYROID gland. Batchelor (J. M.), N. Orl. M. & S. J., 1922, **74**, 468-473.

General discussion.—F. S. H.

THYROID therapy and prophylaxis of goiter with iodine (Zur Prophylaxis und Therapie des Kropfes mit Jod). Baumann (E.), Schweiz. med. Wchnschr. (Basel), 1922, **52**, 280-281.

A word of warning against the indiscriminate use of iodine therapy in every case of enlarged thyroid or so-called goiter since in some cases this condition is a hyperthyroidism which is certainly not helped by iodine administration. Such types of hypertrophed thyroid may occur in children also. The contention is made that the iodine tablets used for the school children contain altogether too much iodine.—F. S. H.

Glandular tests (considered with especial reference to functional disturbances of the THYROID) [L'épreuve des tests glandulaires (considérés surtout dans les maladies par trouble du fonctionnement thyroïden)]. Bernard (S.) & Piédelièore (M.), Progès méd. (Par.), 1922, **37**, 465-467.

Disturbances of function of the ductless glands are studied from the chemical standpoint (basal metabolism) and from the biologic standpoint (glandular tests). The present paper discusses the latter phase. A study was made of the action of **adrenalin** and **pituitrin** injections in patients with hyper- or hypo-function of the thyroid. The authors recognize that injection of these substances is not the equivalent of the secretion of the **suprarenal** and **hypophysis.** The method they used was to give subcutaneous injections of 0.05-0.15 of the extract of the posterior lobe of the pituitary or 1-3 c.cm. of a 1:1000 solution of adrenalin to the reclining patient and note the pulse rate and arterial tension and estimate the sugar output in patients given a meal of bread (100 gm.), milk (150 gm.) and sugar (50 gm). Reactions were usually produced 15-30 minutes after pituitary extract and 35-40 minutes after adrenalin. The sugar was commonly eliminated in the sixth to the ninth hour after injection. In patients with **Basedow's disease** adrenalin produced an intense and prolonged tachycardia, an increase of systolic pressure

and marked glycosuria, whereas in **myxedematous** patients similar injections produced little or no change. Injections of posterior lobe extract caused a definite slowing of the pulse, slow diminution of tension and a glycosuria in hyperthyroid patients and little or no modification of these in hypothyroid patients. Subjects with exophthalmic goiter react markedly to adrenalin and pituitrin, while those with myxedema react less than normal individuals to these injections. In hyperthyroidism the sympathetic and parasympathetic systems respond with a particular intensity to stimulation from adrenalin and pituitary extract, indicating a state of constant irritability of the vegetative nervous system.—C. E. N.

(THYROID) Goiter problem. Bickel (E. F.), Wisconsin M. J. (Milwaukee), 1922, **21**, 87-90.

Reference verified from Quarterly Cumulative Index.

The blood chemistry of THYROIDECTOMIZED sheep. Bodansky (A.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 430-431.

Under controlled conditions it was found that the blood of thyroidectomized sheep differed from that of the normal. The sugar of the normal sheep ranged from 0.06 to 0.07 grams per 100 cc. of blood; the range for the thyroidless animals was from 0.04 to 0.05 grams. The non-protein nitrogen of the normal sheep was from 40 to 42 mg. per 100 cc. of blood; that of the thyroidless animals ranged from 28 to 32 mg.—F. S. H.

(THYROID) A case of familial angioneurotic edema complicated with TETANY (Ein Fall familiären angioneurotischen Oedems, kompliziert mit Tetanie). Bolten (G. C.), Deutsche Ztschr. f. Nervenh. (Leipz.), 1919, **63**, 360-367.

In a family of 12 there were 7 cases of angioneurotic edema. The particular patient concerning whom the report is made was a man of 40 years who suffered from tetany in addition to the usual accompaniments of the primary disorder. From the study of this case and others reported in the literature Bolten is of the opinion that edema of this type is not an individual disease so much as a consequence of a chronic intoxication due to congenital sympathicus hypotonia and **hypothyroidism** which cannot be dissociated from hypotonia. Such a condition obviously results in metabolic disturbances.—F. S. H.

Malignant adenopathy of bones of foot, probably of THYROID origin. Brown (H. R.), J. Am. M. Ass. (Chicago), 1920, **75**, 1780-1781.

A woman, aged 40, complained of throbbing pain in the leg and great toe. She felt "run down," without apparent cause. In 1911 she had had thyroidectomy for a tumor. Her health was good until May, 1916, when she complained of lumbago and a very tired feeling. Shoes worn at about this time were too small, and the toe was

pinched. Later the toe became inflamed and then "broke down," but finally formed granulation tissue and healed. In September, 1916, throbbing and dull pains were noticed in the toes of one foot. A roentgenogram at that time disclosed a distinct loss of bone substance of the toes, four of which were removed at two operations. For a brief interval there were no new developments; but after about a year and a half a swelling was noted on the dorsum of the foot and on the right ankle. The tumor mass was soft and painless to palpation and also to the needle. Radioscopy disclosed a definite loss of bone substance of the fibula and the fifth metatarsal bone, with little or no involvement of the joints. Blood, urine, and x-ray observations elsewhere, in addition to temperature, pulse, and respiratory examinations were negative. The pain in the leg and great toe continuing, a diagnosis of bone tumor of probable thyroid origin was made. Sections of the amputated great toe showed malignant, rapidly growing adenoma, although histologically it was impossible positively to state that the condition was of thyroid origin. Following this diagnosis, the leg was amputated at a point several inches above the tumor masses. One year after the amputation, there were no new developments. The tumor masses appear to have developed in the shaft of the bone in the cancellous tissue, and to have grown by peripheral development to a diameter twice that of the bone itself. As in none of the sections was it possible to find colloid deposits, it cannot positively be stated that the neoplasm had metastasized from the tumor of the thyroid reported to have been found in 1911.—I. B.

THYROTOXICOSIS. Buford (R. K.), West Virg. M. J., 1921, **17**, 100-105.

The author discussed the history, etiology, pathology and symptoms of thyrotoxicosis, and thinks we are a long way from a complete knowledge of the exact function of the thyroid and its effects—both good and ill—on the general physical economy. Crile's theory of likeness of the exophthalmic goiter to the symptoms caused by administration of **epinephrin** and thyroid extracts is interesting and he regards the blood picture as emphasized by Kocher very important and too much neglected in America. Thyrotoxicosis may be exogenous or endogenous. The deleterious substances may be normal metabolic products or the result of pathological processes. Disturbances of the thyroid offer a uniform series of symptoms. The number and severity of the symptoms are more or less dependent upon the amount of hypersecretion, the amount of this hypersecretion which is absorbed, the ability of the organism to neutralize or detoxicate the excessive secretion, and the stability or instability of the venous system. But better cooperation between the surgeon and the internist is needed before we can expect a great reduction in the present all too high rate of mortality, and a complete disappearance of the great numbers of chronic invalids who are at present the victims of thyrotoxicosis.—Author's Abst.

(THYROID) The characteristic electrocardiogram of the cretin sheep. Burlage (S. R.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 425-427.

The electrocardiogram of the cretin sheep which had received no treatment differed definitely from the normal. The P and Q waves were either absent or just discernible. The R and T waves were very small, the latter being negative in all cases. In the case of the cretins which had received **thyroxin** the P waves were nearly normal in height and there were definite Q waves. The R waves were increased in height and the T waves were larger and positive in direction. The cretin treated with NaI in the food and the one treated with thyroxin subcutaneously showed the typical cretin graphs. Of the two lambs given thyroid in the food, one showed a graph slightly more normal than that of the untreated cretin and the other an almost normal picture. One pair of lambs was completely thyroidectomized when 23 weeks old. Subcutaneous treatment with thyroxin was begun 13 weeks later and continued for 15 weeks. Twenty-eight weeks later the electrocardiograms showed a distinct advance towards the normal from the cretin type.—F. S. H.

(THYROID) The treatment of exophthalmic goiter by radiations. Burrows (A) & Morrison (J. M. W.), Proc. Roy. M. & Chir. Soc. (Lond.), 1920, **13**, 132; abst., Am. J. Roentgenol. (N. Y.), 1922, **9**, 690-691.

The abstract cited gives the gist of the original article in considerable detail. In summarizing, the writers discuss the advantages and disadvantages of the medical and surgical treatment of exophthalmic goiter and conclude by saying that they do not think there is evidence that any treatment of exophthalmic goiter gives such safe, uniform and promising results as irradiation of the thyroid gland.—R. G. H.

The relation between THYROTOXICOSIS and tonsillar infection. Brown (L. E.), Laryngoscope (St. Louis), 1922, **32**, 590-607.

Report of the results of a questionnaire. The majority believe that **goiter** is of toxic origin and that the tonsil is no more likely to be the focus of infection than any other location.—H. W.

Acceleration of growth and regression of organ-hypertrophy in young rats after cessation of THYROID feeding. The production of tetany in rats by thyroid feeding. Cameron (A. T.) & Carmichael (J.), Tr. Roy. Soc. Canada (Ottawa), 1922, **16**, Sect. V, 57-70.

The various body organs, heart, kidneys, **adrenals**, liver, etc., which hypertrophy in young white rats as a result of feeding thyroid gland, regain normal size within a few weeks after cessation of such treatment (confirming Hewitt, Endocrinol., **5**, 148), while at the same time there is an acceleration of growth which in most cases

completely compensates for the retardation produced by thyroid feeding. This is attributed to the hypertrophy of the essential organs, the cessation of the thyroxin stimulus, and the subnormal thyroids of the treated animals. Of 72 young rats fed thyroid in this and previous series of experiments 10 developed definite tetany; 4 of these recovered. The immediate cause of such tetany is attributed to the rapid breathing invariably present in these cases.
—A. T. C.

(THYROID) Basal metabolism as aid in diagnosis of toxic goiters. Cannon (J. H.), J. South Car. M. Ass. (Greenville), 1922, **18**, 224-226.

Reference verified from Quarterly Cumulative Index.

Dementia praecox and THYROID (Deménce précoce et phénomènes thyroidiens). Chernbach (M.) & Vasilu (D.), Bull. et mém. Soc neurol., phychiat. et psychol. de Jassy, 1921, **2**, 77.

Case presentation of a young man of 22 years of pathogenic heredity (mental). The patient presented schizophrenic symptoms accompanied by exophthalmia and thyroid hypertrophy. No tachycardia was present.—F. S. H.

THYROID glands. Clark (H. C.), Kentucky M. J. (Bowling Green), 1922, **20**, 547-549.

Some observations on the THYROID gland. Cobb (I. G.), N. York M. J. [etc.], 1922, **115**, 377-382.

From a review of the literature and personal observations the author concludes that goiter is often the result of toxemia. Thyroid therapy is advised in combating toxemia for the reason that the thyroid hypertrophies in its unsuccessful attempt of detoxicating the body.—H. W.

(THYROID) Control of so-called HYPERTHYROIDISM by digitalis and water. Crile (G. W.), N. York M. J. [etc.], 1922, **115**, 376-377.

The cycles of cardiac dilation, tachycardia, fever, nausea and vomiting, restlessness, flushed face, occasional diarrhoea and acetone breath observed in cases of exophthalmic goiter and believed to be caused by an acute overactivity of the thyroid, according to Crile, are simply signs of an acute intracellular acidosis. The acidosis produced from the accumulation of acid products results from the excessive metabolism of exophthalmic goiter. In such cases every organ is overactive, hence it follows that the body requires an increased amount of water in circulation to carry off acid waste products. When the heart is no longer able to circulate water and oxygen to the brain and liver—"motor organs"—there results an intracellular

accumulation of acids. From this reasoning Crile has adapted the use of water and digitalis in both the preoperative preparation and postoperative management of exophthalmic goiter patients. By this means of treatment the mortality rate of 1,869 thyroid operations, including 1,069 for exophthalmic goiter, was 1.3 per cent (25 deaths). The mortality rate of 783 ligations was 0.73 per cent (6 deaths). Technique is given.—H. W.

Contribution to the histophysiology of the THYROID body (Contribution à l'histophysiologie du corps thyroïde). Courrier (R.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 869-870.

Utterström finds an augmentation of colloid in the vesicles after hyperthyroidization, while Jensen obtained opposite results in the tadpole. The author fed young cats 0.5 gm. fresh thyroid for 4 months, and found more colloid in the thyroid vesicles of the experimental animals than in the controls from the same litter. Double secretory polarity which is described by Cowdry is discussed and it is suggested that the cats fed on thyroid have their "milieu interieur" saturated with thyroid products which serve to maintain metabolism, while normal hormones are rendered useless. Thyroid cells are polarized only toward the vesicle and place in reserve the products which have not been utilized in the organism.—T. C. B.

Mechanism of the therapeutic action of iodine in HYPERTHYROID conditions (Mecanismo de la accion terapéutica del yoduro en los estados de hipertiroidismo). Delgado (H. F.), La Crón. méd. (Lima), 1919, **36**, 155-157.

A speculative discussion.—F. S. H.

(THYROID) Surgical treatment of goiter. Epps (C. B.), J. South Car. M. Ass. (Greenville), 1922, **18**, 230-233.

Reference verified from Quarterly Cumulative Index.

(THYROID) Riedel's "iron-like" goiter (Zur Kenntnis der Riedelschen eisenharten Struma). Erkes, Deutsche med. Wchnschr. (Berl.), 1922, **48**, 929.

The author considers this goiter as an inflammation of the thyroid. No details are given.—J. K.

(THYROID) Goiter: from the standpoint of the clinician. Ervin (A. B.), Penn. M. J. (Harrisburg), 1922, **25**, 760-767.

This article is a concise review of the physiology of the thyroid, and the classification and treatment of goiter from the surgeon's point of view. Ervin divides goiter into three types: (1) colloid of adolescence; (2) exophthalmic, and (3) adenoma. Colloid goiter of adolescence is preventable and usually curable by proper iodine administration according to Marine and others, but in this author's ex

perience in a small series of colloid goiter, the administration of potassium iodide resulted in no appreciable reduction in the size of the mass. Exophthalmic goiter constituted 14% of the 530 cases of the author's series. The average age was 33 years, with an average duration of the illness of 3½ years. Though basal metabolism determinations are useful, the skilled diagnostician does not find them essential. The author rightfully states that "the best results are obtained by the man who goes about the treatment of these patients with an open mind, willing to accept whatever may be of the most service to his patient," yet surgery is strongly insisted upon as the treatment holding forth the greatest promise of cure. The treatment of thyroid adenomata, whether simple or toxic, is essentially surgical. It is well for the laity to be informed of the dangers of postponing treatment of an adenoma, as a large percentage develop toxic symptoms so insidiously that marked damage to vital structures may occur prior to final diagnosis, rendering operation more hazardous. Suppurative thyroiditis occurred twice in the author's series; one patient was a girl of 13, the other a woman of 65 Tuberculosis and syphilis of the thyroid are rare. Thyroid carcinoma occurred in 1% of the author's cases.—I. B.

The adrenalin test in the diagnosis of HYPERTHYROIDISM (La prueba de la adrenalina en el diagnóstico del hipertiroidismo). Escudero (P.), Semana méd. (Buenos Aires), 1921, **28**, 116-117.

The author's investigation of the value of the adrenalin test in the diagnosis of hyperthyroidism comprises a study of 180 cases. He found that the reaction is not specific of hyperthyroidism. In patients negative with thyroidin, the adrenaline test was positive in 34%. In patients positive with thyroidin, the adrenalin test was negative in 20%. Experimental hyperthyroidism produced by the ingestion of thyroid gland merely reduces the number of instances negative to adrenalin, but does not eliminate them. These facts speak against the specificity of the adrenalin reaction in the diagnosis of hyperthyroidism.—I. B.

Recent metabolic findings in the diagnosis and treatment of diseases of the THYROID gland. Fahrni (G. S.), Canad. M. Ass. J., 1922, **12**, 386-389.

The material for this paper is prepared from personal observation of a series of cases presenting evidence suggestive of disturbed thyroid function. The writer endeavors to show how the careful estimation of basal metabolism strikes at the very heart of diagnosis. This applies particularly in differentiating hyperthyroidism from psychoneuroses, essential hypertension, neurocirculatory asthenia and certain other pathological conditions, the clinical appearances of which are frequently confused with that of disordered function of the thyroid gland. The help given by metabolism estimation in both surgical and medical management of cases of hyper-

thyroidism is clearly demonstrated, especially as regards the operability of cases. In the treatment of myxedema the metabolic rate furnishes a very exact guide to dosage required, a guide much more delicate than could be obtained by any other means, not excepting the clinical picture. The author is careful to emphasize that the introduction of indirect calorimetry must not be used in any manner to the exclusion of the clinical findings and history, but thinks that these three should be inseparably associated in the diagnosis and treatment of thyroid diseases.—J. H.

(THYROID) A case of scleroderma (Ein Fall von Sklerodermie). Forschbach, Deutsche med. Wchnschr. (Berl.), 1922, **48**, 1122.

A case of scleroderma became much worse after influenza set in. During recovery from the influenza thyroidin was given and improvement was seen. No details are given.—J. K.

(THYROID) Observations on the diagnosis of toxic goiter. Frank (L. W.), Kentucky M. J. (Bowling Green), 1922, **20**, 159-166.

Diarrhoea and seminal emissions when present are indicative of severe thyrotoxicosis. The operability of a case of thyroid disturbance should not be determined by the amount of increase in the metabolic rate, but by the condition of the myocardium.—H. W.

Further studies on the ligation of the THYROID arteries in DEPANCREATIZED DIABETIC dogs. Friedman (G. A.) & Gottesman (J.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 209-215.

Thirty-seven dogs were depancreatized. Nine did not develop glucosuria, although in some of them repeated pancreatectomies were performed at various intervals. Three of the animals showed transient glucosuria. Twenty-five dogs became permanently glucosuric. Nine died from various causes. Ligations of all of the thyroid arteries were done in 8 of 16 glucosuric dogs. Three of these dogs died. The five remaining were studied. The great loss in weight due to the loss of the pancreas was not stopped. Glucosuria, however, was checked. **Tetany** or infection interfere with the disappearance of glucosuria. Partial ligation apparently intensifies glucosuria.—F. S. H.

The relation of the THYROID and PARATHYROIDS to PANCREATIC DIABETES in dogs. Friedman (G. A.) & Gottesman (J.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 215-221.

Diabetic dogs are more susceptible to **tetany** after partial parathyroidectomy and thyroidectomy than non-diabetic dogs after the same procedure. Very few animals were used. The removal of the thyroid in diabetic dogs seems to check glucosuria provided tetany does not occur. If tetany does occur intravenous injections of calcium lactate may act as a palliative in checking temporarily both tetanic seizures and glucosuria.—F. S. H.

The effect of THYROIDECTOMY in two sittings upon DEPANCREATIZED, non-glycosuric, but hyperglycemic dogs. Friedman (G. A.) & Gottesman (J.), Proc. Soc. Exper. Biol & Med. (N. Y.), 1922, **19**, 388-389.

One sided lobectomy does not check hyperglycemia; neither does partial ligation. Complete thyroidectomy in the hyperglycemic dog brings the blood sugar to normal. When a minute remnant is left after the second operation on the thyroid the blood sugar in the depancreatized dogs drops to normal and then rises. The three dogs used all gained in weight what they had lost after the pancreatectomy. They all showed a high blood sugar after incomplete thyroidectomy and a tendency to adiposity.—F. S. H.

THYROID-PARATHYROID insufficiency and gestation (Insuffisance thyro-parathyroidienne et gestation, étude clinique). Fruhinsholz (A.), Gynéc. et Obst. Rev. (Par.), 1922, **6**, 145-166.

A brief review of the clinical evidence of the simultaneous occurrence of hypothyroidism and gestation followed by a report of 4 pregnant patients having typical symptoms of myxedema fruste. In every case renal disturbances of various intensity were present. A short review of the supposed relation between eclampsia and parathyroid insufficiency is given.—F. S. H.

The functional relation between the THYROID and the other glands of INTERNAL SECRETION (Les relations fonctionelles de la thyroide avec les autres glandes à sécrétion interne). Garnier (M.), J. méd. franç. (Par.), 1921, **10**, 2-22.

A general dissertation containing no new data.—F. S. H.

Acute suppurative THYROIDITIS. Gilman (P. K.), Calif. State J. M. (San Fran.), 1921, **19**, 294-295.

Discussion of etiology, symptomatology and handling of suppurative thyroiditis. Report of a case.—H. W.

(THYROID) Some physiological data on the viscacha (Quelques données physiologiques sur la viscache). Giusti (L.) & Hug (E.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 688-689.

In the rodent viscacha (Molina) the thyroids have the same situation as in rabbits. Thyroidectomy greatly retards growth.

—T. C. B.

Relations between the emotional constitution, the THYROID gland and the affective psychoses (Relations entre la constitution émotive, la glande thyroïde et les psychoses affectives). Goldner (J.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy. 1919, **1**, 45-49.

A case report which, according to the author, brings to the fore the relations expressed in the title.—F. S. H.

A case of THYROID-OVARY psychosis cured by thyroidectomy and ovarian opotherapy (Sur un cas de psychose thyro-ovarienne guéri par thyroïdectomie et opothérapie ovarienne). Goldner (J.) & Gheorghiu (V.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 11-17.

The title tells the story and is taken by the authors to prove the important rôle of thyroid hyperfunction in mental disorders.
—F. S. H.

Administration of THYROID gland in hydrocephalus. Gray (J. P.), Lancet (Lond.), 1922, **ii**, 177.

This is a brief clinical note describing a case of extreme hydrocephalus in an infant treated successfully with thyroid extract. The hydrocephalus developed at the age of 6 months. When other therapeutic measures had failed and the patient was in an almost hopeless condition, thyroid extract, ½ to 1 grain per day, caused prompt improvement and, according to the author, complete cure within 8 months.—I. M.

(THYROID) Suppurative strumitis during puerperal infection (Les strumites suppurées au cours de l'infection puerpérale). Grimault (L.) & Brino (H.), Gynéc. et Obst. Rev. (Par.), 1922, **6**, 167-175.

Report of a case of suppurative thyroiditis in puerperal infection and review of the literature. It is shown that the disturbance usually arises in a pre-existing goiter. The symptoms are essentially those of thyroiditis. Prognosis is grave. The mortality recorded is 11%. Surgical interference is indicated.—F. S. H.

The influence of restricted diet and THYROID feeding on the tadpoles (Unzureichende Ernährung und Hormonwirkung. II. Der Einfluss unzureichender Ernährung und Schilddrüsenfütterung auf den Sauerstoffverbrauch der Larven von Rana temporaria). Groebbels (F.), Ztschr. f. Biol. (München. u. Leipz.), 1922, 156-168.

The metabolism and the consumption of O_2 of tadpoles fed insufficiently and lagging in their growth is relatively greater than of normal animals of the same age. In normally fed animals given thyroid in addition the consumption of O_2 is increased. With diminishing body weight it increased both absolutely and relatively. Animals with insufficient food plus thyroid consume relatively less O_2. Thyroid effects may thus be influenced by nutritional conditions.
—Physiol. Abst., **7**, 312.

(THYROID) The relation of water to the production of goiter. Guittard (V. D.), Kentucky M. J. (Bowling Green), 1922, **20**, 612-615.

From a review of the literature the author concludes that goiter is a water-borne disease occurring in areas of iodine deficiency.
—H. W.

Toxic adenoma of THYROID gland. Gunby (P. C.), Texas State J. M. (Ft. Worth), 1922, **18**, 204.

The writer reviews Plummer's differentiation of exophthalmic goiter and toxic adenomas of the thyroid but does not emphasize the necessity for removal of adenomas before toxic symptoms develop. He states that ligation is ineffective in adenomas, that radium and x-ray are usually of only temporary benefit.—C. R.

Studies of the THYROID apparatus. VII. A differential effect of THYRO-PARATHYROIDECTOMY and PARATHYROIDECTOMY on the incisor teeth of the albino rat. Hammett (F. S.), Am. J. Physiol. (Balt.), 1922, **62**, 197-201.

Of 20 rats with the thyroids and parathyroids removed, only one, or 5%, developed dental defects, while of 26 rats with the parathyroids alone removed, twenty, or 76.9%, developed defects of the teeth. It is suggested that as the function of the thyroid is stimulative, "and the function of the parathyroids is inhibitive of a certain phase of nitrogenous metabolism, the by-products of which may give rise to general stimulation when not taken care of by the parathyroid secretion," the result may be a disturbance of calcium metabolism, resulting in dental defects, when the parathyroids are removed.—T. C. B.

(THYROID) Surgical treatment of exophthalmic goiter. Hill (J. H.), Texas State J. M. (Ft. Worth), 1922, **18**, 205.

Hill believes that exophthalmic goiter is a surgical, not a medical disease, that many cases are operated upon late because of discouraging advice of physicians. He believes that those who persist in treating these cases medically until they become poor surgical risks, only referring them to the surgeon as a last resort, do their patient great injustice.—C. R.

Metastasis of a cancer of the stomach in the THYROID; growth into the larynx (Schilddrüsenmetastase eines Magenkarzinoms mit Einwachsen in den Kehlkopf). Hofer, Wien. klin. Wchnschr., 1922, **35**, 612.

No details are given.—J. K.

(THYROID) Some observations on the treatment of HYPERTHYROIDISM with x-rays. Holmes (G. W.), Am. J. Roentgenol. (N. Y.), 1921, **8**, 730-740.

The results of observations of x-ray therapy in a series of cases studied at the Massachusetts General Hospital are presented, and the importance of the cooperation of the clinician, surgeon and roentgenologist is emphasized. Colloid, cystic and simple goiters are not amenable to the x-rays. Malignant goiter requires immediate operation followed by postoperative raying and if surgery is for

some reason contra-indicated, roentgenization alone may result in temporary benefit. Toxic adenomata respond readily to x-rays, but surgery yields more prompt relief. Non-toxic adenomata may yield to roentgenization, but as a rule these cases are kept under observation or treated surgically. Exophthalmic goiter responds satisfactorily to roentgenotherapy. In very toxic cases, a period of rest precedes the institution of x-ray treatment. Eight case histories are reviewed exhibiting the merits as well as the faults of x-ray therapy. Holmes advises the following technic. The dosage varies with the type of case. In early cases an 8-inch target-skin distance is used; 4 mm. aluminum filter with 8 inch parallel spark gap between points is employed. Lately, he has been using a 10 inch and in some cases a 16 inch skin distance, thus increasing the amount of radiation to the gland with a proportional diminution of radiation to the skin. In most cases three exposure areas are used, one on each side of the neck and one over the thymus region. In some instances where a 16 inch distance is used, one single exposure is given in the midline, including the thyroid and upper thymus regions. In certain cases, 5 areas of exposure are used, one over each side of the neck. one over the thymus, and two over the back of the neck. The time interval between treatments is usually 3 weeks, but in some instances it is 2 weeks. The author believes that a shortening of the interval between treatments is preferable to an increase of dosage when a maximum effect of radiation is desirable. Results of treatment are checked up by basal metabolism observations. The question of skin tolerance must always be borne in mind, and erythema is rarely necessary. There is always a possibility of such injury to the skin as atrophy and telangiectasis; these can be avoided by keeping well below the erythema dose. In cases responding favorably to treatment, there is at first an improvement in the nervous symptoms, observable within 3 weeks; at the end of 6 weeks a drop in pulse rate and metabolism is seen, but in many instances clinical response is more gradual. The metabolism and pulse rate may return to normal after 6 or 7 treatments have been given, corresponding to a period of 4 to 6 months. Weight is gradually increased, goiter is reduced, and exophthalmos, if present, is relieved. In cases which do not yield to x-rays, rest is insisted upon or surgery resorted to after the fifth or sixth treatment. Cases having received treatments over periods of from one to two years have been found more difficult at operation. Myxedema may result from too heavy or too prolonged radiation, or it may develop several years after radiation because of contracting connective tissue. It must be borne in mind, however, that a patient with hyperthyroidism may develop myxedema under any treatment and even spontaneously.—I. B.

Some phases of DYSTHYROIDISM. Howard (C. P.), Canad. M. Ass. J., 1922, **12**, 606-609.

It is held that a normal basal metabolic rate can at most signify an absence of a marked thyroid toxicity. The author differs with

Plummer and Boothby, who "insist that the term 'hyperthyroidism' implies necessarily an increased metabolic rate." A series of 12 cases is cited to prove his point, the clinical symptoms being summarized in such a way that a clear picture of dysthyroidism is presented and all in the absence of an increase in the basal metabolic rate. In 2 cases the superior thyroid arteries were ligated. "In the future we shall unhesitatingly urge a partial lobectomy as the procedure of choice."—J. H.

Ligation operations in the treatment of diseases of the THYROID gland. Hume (W. I.), Kentucky M. J. (Bowling Green), 1922, **20**, 344-348.

It is of the greatest importance to reduce thyroid activity, especially in the handling of exophthalmic goiter. Ligation of the superior poles of the gland, though temporary in its effect, and not without a mortality of its own, is at present, perhaps, the safest measure of affecting a reduction in the activity of the gland.—H. W.

Three years of THYROID observations (Drei Jahre Schilddrüsenmessungen). Hunziker (H.), Schweiz. med. Wchnschr. (Basel), 1920, **50**, 1009-1014.

Studies were made of the influence of iodine administration to children on the size of the thyroid gland as measured by the circumference of the neck in two positions, upright and flexed. Apparently the ingestion of iodine tends to result in a thyroid of smaller size in many cases.—F. S. H.

Roentgen ray therapy of HYPERTHYROIDISM. Jenkins (I. W.), Texas State J. M. (Ft. Worth), 1922, **18**, 213.

Jenkins states that radio-therapy is effective only in exophthalmic goiter and toxic adenoma, and in the latter believes that surgery is perhaps advisable, as the risk is slight and recovery quicker. In exophthalmic cases and cases in which the thymus is involved, he commends radio-therapy even though surgery is to follow.—C. R.

Basal metabolism determination and its technical difficulties. Jones (H. M.), J. Lab. & Clin. M. (St. Louis), 1922, **7**, 191-198.

A thorough knowledge of the basic principles common to all methods and devices employed in basal metabolism determination is the outstanding essential to success. The result of a given determination should be the algebraic sum of the plus and minus errors from at least three widely different sources, namely: (1) the test subject, who, though in normal health may have a metabolic rate varying several per cent from his expected rate, and who may cooperate irregularly or not at all in the performance of the test; (2) the technician, who must execute many details and observations besides those pertaining directly to the manipulation of the instrument; and (3) the apparatus itself, which may introduce error, perhaps consistent, perhaps variable, because of certain of its mecha-

ical defects unknown to the operator. In 1920, the author, while testing out his own apparatus, made comparisons of its results with those of apparatus of other makes in nearby hospitals and laboratories, and it was then that he observed the most noteworthy, not to say startling, errors committed in metabolic determination. For example, in a normal test subject, the metabolic rate was seen to vary from —17 to +90 through various errors, all of which were discovered to be classifiable in the above mentioned groups. On subsequent occasions the author found this deplorable state of affairs to exist throughout all parts of the country, and aptly states that "any technician or clinician who feels that his own results are an exception to this, should see to his own technic in securing normal readings on known normal subjects before offering challenge to the proposition." Since the subject, the technician and the apparatus are severally responsible for the errors encountered in these tests, the beginner should start with one of these factors as a known and relatively fixed quantity, namely, a cooperative test subject in normal health. In this way, the other two sources of error may then be reduced to known quantities, and in turn eliminated. On over 100 different occasions, Jones witnessed the beginning technic of over 100 clinicians or their technicians. Not one of them, during their first attempts, came anywhere near the proper handling of the apparatus or the subject during the period of testing. On one occasion the technician reports a +8 per cent reading on a suspected hyperthyroid patient. The subject was dismissed as a "neuro." Four months later, the physician, convinced that some error in the test had been made, ordered the technician to make a second test. This time the reading was +58 per cent. Soon it was discovered that the rate as determined two months previously should have been reported as +35 per cent instead of +8 per cent. Now, however, the patient was so much worse that radical operation performed two weeks later eventuated fatally. On another occasion Jones observed a patient nearly asphyxiated during the course of the test because a tank of gas supposedly oxygen but containing nitrous oxide was used. Jones emphasizes the importance of the technician's ability to secure normal readings on known normal subjects, and unless the operator is equal to this task, results with suspected pathological cases are unreliable. It is not enough to imagine that the apparatus is accurate if it will give a plus reading on a known hyperthyroid patient, since an inaccurate apparatus may still give the desired plus reading. Having learned the technic on normal subjects, the tests may be made in a series of pathological cases. If, in the meanwhile, a mechanical defect giving rise to an error is suspected, the operator must endeavor to eliminate it by another series of observations on persons known to be normal. The technician's desire to learn, coupled with duplicate determinations and appropriate controls, are essential in rendering basal metabolism observations reliable.—I. B.

(THYROID) A clinical classification of HYPERTHYROIDISM—exophthalmic goiter. Johnson (C. C.), Nebraska M. J. (Omaha), 1921, **6**, 70-72.

A discussion of the symptomatology and treatment of goiter based upon the author's conception of a working clinical classification of diseases of the thyroid, which is as follows: A. Primary, (a) fulminating, (b) acute, (c) subacute; B. Secondary, (a) typical, (1) adolescent, (2) mature, (b) atypical, (1) mature; C. Neurotic, (a) adolescent, (b) adult. Primary goiters are exophthalmic in type, the pathology of which closely resembles malignancy. In the fulminating form the expectant treatment is indicated, as surgery hastens death. In the acute and subacute forms close observation, tact, a reduction of psychic trauma with sedative and supportive measures should dominate treatment. When the weight is restored to normal, active treatment should be considered. In the management of exophthalmic goiter conservatism is the rational attitude, and surgery should never be employed except as an emergency measure. Secondary goiters are non-exophthalmic in type, of varying pathology. In the adolescent form the removal of discoverable infectious foci, rest, hygiene, medication, with or without x-rays yield results, and when there are cystic or adenomatous changes, surgery is indicated. Mature goiters are potentially treacherous, as they are capable of becoming toxic or malignant in nature; hence surgery is the treatment of choice. The atypical goiter is often overlooked as the symptoms are mild and at a distance from the thyroid. X-ray treatment (plus medicinal measures) yields good results, and if cystic or adenomatous conditions exist, surgery is indicated. Neurotic forms of goiter present hypertrophic adenomatous, round cell infiltration with or without colloidal or cystic changes. Mental symptoms in the nature of hysteria, precocity, or a psychosis are apt to predominate. Exophthalmos is absent, but tremor, tachycardia and enlarged thyroid are common. These patients do poorly under any treatment. Hospitalization with the services of a neurologist is advised. Both x-rays and surgery are disappointing in the treatment of this type.—I. B.

Basal metabolic rating as a basis of classification and treatment of THYROID conditions. Jones (H. P.), N. Orl. M. & S. J., 1922, **75**, 28-32.

A short paper in which thyroid conditions are divided into 3 types, depending upon whether there be minus, normal, or plus basal metabolism. Basal metabolism observations are the only reliable guide in the diagnosis of thyroid affections and they assist in the indication of the mode of treatment to be adopted in a given case.

—I. B.

(THYROID, DIABETES) Observations on the excretion of sugar in the urine in health and disease. Kast (L.) & Croll (H. M.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1921, **19**, 84.

In **hyperthyroidism** the average range of sugar excretion was between 0.46 and 0.98 grams. In one case of hypothyroidism the average excretion was 0.40 grams. In 4 normal adults the average daily amount was between 0.59 and 1.14 grams. In **diabetes** alone is there an increase.—F. S. H.

(THYROID) Adiposis dolorosa (Ueber Adipositas dolorosa). Kaufman (F.), Schweiz. Arch. f. Neurol. u. Psychiat. (Zürich), 1921, **9**, 108-124.

Report of two cases of adiposis dolorosa in which the idea of **thyroid** or **pituitary** participation was not tenable. Beneficial results were obtained from the ingestion of thyroidin to tolerance. The improvement is attributed to general metabolic stimulation.—F. S. H.

THYROID preparation. Kendall (E. C.), U. S. Patent 1,392,767, Oct. 4, Chem. Abst. (Easton, Pa.), 1922, **16**, 465-466.

A description of the method of separating active thyroid preparations from thyroid glands.—F. S. H.

THYROID preparation. Kendall (E. C.), U. S. Patent 1,392,768, Oct. 4, Chem. Abst. (Easton, Pa.), 1922, **16**, 466.

A modification of the procedure included in the foregoing patent.—F. S. H.

Anaphylaxis in thyroidectomized animals fed with THYROID (Anaphylaxie chez les animaux ethyroïdes nouris avec de la thyroïde). Képinow (L.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 409-411.

It has been shown that thyroidectomized animals, after sensitizing injections of horse serum, do not contain in their blood the substance necessary to confer passive anaphylaxis on other animals, either operated upon or not. The present report attempts to answer the question whether the feeding of thyroid to such animals will restore this substance. Of 10 thyroidectomized guinea pigs, 7 were fed dried thyroid, while 3 were kept as controls. Eighteen days after the sensitizing injections all were given an intoxicating dose. The 7 that were fed thyroid died of typical anaphylaxis, while the controls showed no symptoms. The blood of thyroidectomized animals that have been sensitized to horse serum, and at the same time fed dried thyroid, will confer a passive anaphylaxis when injected into other animals.—T. C. B.

The rôle of the THYROID gland in anaphylaxis (Contribution à la question du rôle de la glande thyroïde dans le phénomène d'anaphylaxie). Képinow (L.), Compt. rend. Soc. de biol. (Par.), 1922, **87**, 494-495.

A short discussion of Kepinow's theory, that the thyroid interferes with the elaboration of substances necessary for the production of anaphylaxis.—T. C. B.

THYROID gland and anaphylaxis (Glande thyroïde et anaphylaxie). Képinow (L.) & Lanzenberg (A.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 906-908.

In a previous note (see Endocrin., 1922, **6**, 579), it has been shown that thyroidectomized animals do not suffer from anaphylactic shock. The present paper deals with passive anaphylaxis. Horse serum was the sensitizer; rabbits and guinea pigs were used. Normal guinea pigs, when injected with the blood of sensitized guinea pigs, suffered from anaphylactic shock. Thyroidectomized guinea pigs suffered anaphylaxis when injected with the blood of sensitized guinea pigs. Normal guinea pigs injected with the blood of thyroidectomized guinea pigs previously treated with horse serum gave no symptoms. The same is true for the blood of rabbits injected into guinea pigs. Thyroidectomized animals can be sensitized passively, and present the phenomena of anaphylactic shock when injected with an intoxicating dose, but their blood is lacking in some substance necessary to sensitize non-operated animals.—T. C. B.

Observations on the cardiovascular system in THYROID diseases. Kerr (W. J.) & Hensel (G. C.), Calif. State J. M. (San Fran.), 1922, **20**, 306-309.

From a consideration of 181 goiters, 123 of which were classified as adenomatous and 58 as hyperplastic, the authors conclude that cardiovascular changes are progressive in nature. The cardiac signs and symptoms in toxic adenomas and hyperplasias differ only with the degree of toxicity. Cardiac irregularities are common. Auricular fibrillation, usually paroxysmal in type, occurs in about 33 per cent of all toxic cases. Treatment depends upon the degree of the thyrotoxicosis. Digitalis is of great value in controlling auricular fibrillation and should be continued over long periods of time.
—H. W.

(THYROID) The relation between the blood and the organs (Beziehungen zwischen Blut und Organen). Kottmann (K.), Schweiz. med. Wchnschr. (Basel), 1920, **50**, 1060-1064.

The author reports that there is a difference in the ability of serum from patients with various types of **thyroid** disturbances to reduce colloidal silver iodide on the addition of hydroquinone. Serum from Basedow's disease apparently causes a marked retardation of the reduction. This is attributed to an extremely fine state of division of the iodized colloid. On the other hand, serum from goitrous patients accelerates the reduction. There is a correlation between these findings and the histological appearance of the thyroid in the two disorders. In the one the colloid is thin; in the other, concentrated. On the basis of these observations a theory is built up which as yet needs other evidence for substantiation. The relation of **parathyroid** function to guanidine metabolism is discussed.
—F. S. H.

(THYROID) Basal metabolism in Basedow's disease (Métabolisme basal chez les Basedowiens). Labbé (M.) & Stévenin (H.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1012-1014.

An examination of 8 cases of typical Basedow's disease, 11 cases of "Basedow fruste," 6 cases of simple goiter and 1 case of unilateral exophthalmos confirms the results of others. In the typical cases the metabolism is constantly and strongly augmented (average 66%). In the "formes fruste" there is also augmentation (average 51%). In simple goiter metabolism is often normal, but may be a little augmented. The measure of metabolism is useful in the diagnosis and prognosis of Basedow's disease.—T. C. B.

(THYROID) Induced hyperglycemia in Basedow's disease (L'hyperglycémie provoquée chez les Basedowiens). Labbé (M.), Labbé (H.) & Nepveux (F.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1014-1015.

The test of induced hyperglycemia and the measure of basal metabolism are two physiological procedures that have a great value in the diagnosis of the hyperthyroid state.—T. C. B.

Basal metabolism as an index of treatment in diseases of the THYROID. Lahey (F. H.) & Jordan (S. M.), Boston M. & S. J., 1921, **184**, 348-358.

Report of 304 tests on 135 individuals, 25 of whom were normal and 110 with thyroid disease. Metabolism determinations are of great value in determining the degree of thyroid function following operative procedures.—H. W.

Psychosis of THYROID origin (Les psychoses thyroïdiennes). Laignel-Lavastine (M.), Progrès méd. (Par.), 1922, **37**, 158-163.

A theoretical, philosophical discussion of the frequent relationship found to exist between psychoses and thyroid disturbances leading to the conclusion that the dysthymias of thyroid origin depend more upon the psychic entity than upon the chemical cosmos.

—F. S. H.

(THYROID) Diagnosis and treatment of toxic goiters. Lemmon (C. J.), J. South Car. M. Ass. (Greenville), 1922, **18**, 226-230.

Reference verified from Quarterly Cumulative Index.

Anaphylaxis, colloidoclasis, THYROID body (Anaphylaxie, colloidoclasie, corps thyroïd). Lévi (L.), Compt. rend. Soc. de biol. (Par.), 1922, **86**, 1083-1084.

The author points out that in 1912, without furnishing experimental proof, he discussed the rôle of the thyroid in the problem of anaphylaxis.—T. C. B.

(THYROID) A study of exophthalmic goiter and the involuntary nervous system. VIII. A clinical and laboratory study of the in-

voluntary nervous system. Lieb (C. C.), Hyman (H. T.) & Kessel (L.), J. Am. M. Ass. (Chicago), 1922, **79**, 1099-1101.

According to the authors the manifestations of exophthalmic goiter may be divided into the metabolic disturbance measured by the basal metabolism, and the sympathomimetic symptoms (tachycardia, exophthalmos, polyrrhea, sweating, etc.). To a clinical association of sympathomimetic symptoms and normal basal metabolism the term "autonomic imbalance" is applied. In 86 cases of this latter type the commonest symptom was lability of pulse rate, thyroid enlargement being second in frequency. In 84% both were present. In all the basal metabolism was normal. In attempting to discover a pathognomonic clinical test the response to atropin and epinephrin was studied. In 80 normal subjects 33% reacted to epinephrin and 25% to atropin. In a few cases of autonomic imbalance and 50 cases of exophthalmic goiter the intensity of drug reactions did not parallel the severity of the symptoms, although only 6% failed to react to one or the other drug. The authors are convinced that the epinephrin reaction (Goetsch) is independent not only of the normal, but also of the hyperplastic thyroid gland. Results of animal experiments in which the response of the pithed cat to repeated injection of similar doses of epinephrin was investigated are to be published later. This research led them to conclude that the epinephrin sensitization is independent of the ductless glands and is not a specific hormone effect, but is a physico-chemical change involving the myoneural junctions of the thoracico-lumbar system. It seems unwise to call exophthalmic goiter and autonomic imbalance endocrine disorders. The relationship between autonomic imbalance and exophthalmic goiter is not clear, but the former often precedes the latter and transition stages are seen.—W. M. A.

Pathological classification of THYROID gland diseases with radium treatment in toxic goiter. Loucks (R. E.), Am. J. Roentgenol. (N. Y.), 1921, **8**, 755-765.

This article is an exposition of the author's conception of the pathological classification of goiter, with mention of Plummer's clinical classification, and does not lend itself to detailed abstracting. The symptoms of toxic adenoma and of exophthalmic goiter are outlined and a few clinical features differentiating the two are mentioned. Among the symptoms of bad prognosis in exophthalmic goiter are exophthalmos for two or more years, edema of the extremities, auricular fibrillation, hypertension, marked emaciation, high metabolic rate, persistent diarrhea, cerebral symptoms, acidosis and a positive Wassermann reaction. With regard to treatment, it is stated that if after two weeks of hygienic, dietetic and medicinal measures, there are still evidences of thyroid toxemia, a choice between surgery, x-ray and radium must be made. Surgery in toxic goiter is not advocated. Radium is the treatment of choice because

it is portable, less exciting, easily controlled, does not produce sudden toxemia, and the results are more promising than with x-rays. Radium treatment must be supplemented with the usual medicinal treatment. At least 100 mgm. of radium are used in four tubes, each screened in 1 mm. of brass and 1 mm. gum rubber. The screened tubes are placed on a gauze pad 2 cm. thick to get distance and protect the skin. Two or three ports are exposed over the thyroid, depending upon the size of the gland, size of the pad, and the amount of radium used. The time of exposure is from 8 to 10 hours over each part.—I. B.

(THYROID) The world's supply of iodine in relation to the prevention of goiter. McClendon (J. F.), Science (N. Y.), 1922, n. s. **56**, 269-270.

An analysis of sea water obtained at Santa Monica, Cal., showed 0.05 mgm. of iodine per liter. Water taken from the Great Salt Lake, Utah, contained 40% more iodine than sea water, but the chlorine was 500% greater. This indicates that weathering of both igneous and sedimentary rocks gives very little iodine. Thus inland waters would contain very little of this element. It is suggested that powdered kelp be used with food to furnish iodine. Table salt could be made from sea water, thus furnishing iodine.—F. A. H.

(THYROID) Feeble-minded and backward children. McCready (E. B.), Internat. Clin. (Phila.), 1922, **3**, 118-162.

A good historical and clinical discussion on the subject of mentally deficient children, with brief mention of **cretinism**, and of endocrine implications in treatment. While opotherapy frequently yields brilliant results in cases of undoubted endocrinopathy, the use of glandular products as a panacea or specific in the management of defectives generally will meet with disappointment.—I. B.

Helpful technique for operations on the THYROID gland. McNerthney (J. B.), Northwest Med. (Seattle), 1922, **21**, 189-191.

A goiter clamp, self-retracting, is described obviating the maladroit careless mauling and hauling of an inexpert assistant. Directions are given for accurate local anaesthesia in thyroid surgery. —H. L.

The emotional factor in the pathogenesis of HYPERTHYROIDISM (Le facteur émotionnel dans la pathogénie des états hyperthyroïdiens). Marañón (G.), Ann. de méd. (Par.), 1921, **60**, 81-95.

After citing some 48 cases and giving a brief review of the prevalent opinions Marañón concludes that the emotions have an undoubted influence in the pathogenesis of Basedow's disease and other hyperthyroid conditions. In the majority of cases emotion is effective in individuals predisposed to hyperthyroidism. In the minority of cases emotion acts as the primary cause.—F. S. H.

(THYROID) Affections of the ear in CRETINISM (Les affections de l'oreille dans le crétinisme). Mager (F. D.), 10th Cong. internat. d'otol. (Par.), 1922, July 19-22; abst., Presse méd. (Par.), 1922, **30**, 703-704.

The author first brings out the clinical symptoms of endemic cretinism, especially from the point of view of lesions of the ear. Aside from recognized cretin deafness with signs of degeneracy like dwarfism, defective intelligence, goiter, and cutaneous alterations, there are also other forms of deafness. In these last cases isolated signs of degeneracy are often more or less marked. With the aid of a series of microscopic sections Mager points out the anatomical and microscopical changes in the ear which he has found lately in a very large number of cases.—R. G. H.

Use and abuse of the THYROID. Means (J. H.), Boston M. & S. J., 1922, **187**, 164-168.

The author takes up the discussion of the value of thyroid extract in diseases of the thyroid gland. He then warns against its use in the treatment of obesity. Three metabolism charts are shown.—J. C. D.

The effects of THYRO-PARATHYROIDECTOMY on the guinea-pig (Sur les effets de la thyro-parathyroïdectomie chez le cobaye). de Mira (F.), J. de Physiol. et de path. gén. (Par.), 1919, **17**, 976-980.

From the results of the operation of thyro-parathyroidectomy on 12 guinea-pigs, de Mira concludes that the total extirpation of this apparatus is fatal for these animals. The animals died in from 2 to 57 days. They exhibited apathy. There were general muscular fibrillations. Attacks of tetany preceded death. The animals operated upon lost weight. The author concludes that age is not a factor in the resistance to the loss of the glands.—F. S. H.

The effects of THYROID, THYROXIN and other iodine compounds upon the acetonitrile tests. Miura (M.), J. Lab. & Clin. M. (St. Louis), 1922, **7**, 349-356.

A reinvestigation of the activity of iodine in different samples of thyroid and in the other iodine compounds, including thyroxin, with the acetonitrile test. The studies showed that when desiccated thyroid is fed to mice it protects them against poisoning with acetonitrile. The thyroid seems to be efficient in proportion to the amount of iodine contained. Potassium iodide and di-iodotyrosine gave no protection against acetonitrile in whatever quantity fed. When thyroxin was fed in such an amount that it furnished one-third the iodine provided by the most active thyroid fed, a greater protection was given in some cases. Increasing the amount of thyroxin decreased the protection against acetonitrile and caused loss of weight of the animals.—F. S. H.

(THYROID) Endemic goiter in the Republic of Mexico (Contribution al estudio del bocio endemico en la Republica Mexicana). Nájera (F. C.), Rev. Mex. de biol., 1920, **1**, 47-60.

This is a very good, though brief, description of the distribution of goiter in Mexico. There is also a discussion of the probable causes of appearance of endemic goiter in the regions in which it is found, based on similar observations in other countries by other workers. The methods for prophylaxis advocated are those already known.—F. S. H.

(THYROID) Goiter prophylaxis (Zur Kropfprophylaxe). Oswald (A.), Schweiz. med. Wchnschr. (Basel), 1922, **52**, 313-315.

Oswald criticises the size of the dose used by Marine and Kimball as being too large. The claim is made that 8 mg. of iodine daily and even 2 mg. daily is sufficient as a prophylactic measure and avoids the danger of iodism.—F. S. H.

(THYROID) Case of paroxysmal hemoglobinuria benefited by ENDOCRINE treatment (Un cas d'hémoglobinurie paroxystique corrigée par l'opothérapie endocrinienne). Pareja (J. M.), An. Fac. de Med. (Montevideo, Uruguay), 1921, **6**, 209-228.

A man of 27 began to excrete blood in the urine when 15 years old after exposure to extreme cold. His brother had the same affliction. The patient showed a normal cardio-vascular system. The apex of the right lung was slightly obscure. The external **genitals** were hypoplastic as was the **prostate**. Distribution of pubic hair was feminine. Ossification of the epiphyses was apparently normal. When I mg. of **adrenin** was injected no tachycardia, polyuria or glucosuria was produced. Physostigmine slowed the pulse for only a few minutes. Atropine failed to modify the rate of the heart or affect the pupil. **Thyroid** opotherapy caused an increase in nitrogen excretion. The thyroid was not clearly palpable. The sella turcica was normal. Mentality was sub-normal for the age. Libido was absent. The diagnosis of hypothyroidism was made. The blood picture was about normal. With the exception of the hemoglobin, the urine was normal. During the attacks of hemoglobinuria characteristic changes in blood and urine occurred. An eosinophilia appeared. A positive Wassermann was given. Specific treatment for the latter apparently had but little effect on the hemoglobinuria. However, when thyroid gland substance, beginning with 25 mg. and increasing to tolerance, was given, improvement was marked.

—F. S. H.

Cicatrization of the wound in THYROIDECTOMIZED guinea-pigs (Sur la cictrization des plaies chez les cobayes éthyroïdes). Parhon (C. J.) & Savini (E.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 4-5.

Cicatrization in thyroidectomized guinea-pigs is delayed more than in test animals which have been similarly wounded but not thyroidectomized.—F. S. H.

Changes in the THYROID in a case of manic-depressive psychosis with a predominance of the phenomena of confused melancholia (Altérations importantes de la glande thyroïde dans un cas de psychose maniaque-depressive avec prédominance des phénomènes de mélancolie confusive). Parhon (C. J.), Bull. et mèm. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 33-37.

The follicles in the gland removed from this case at autopsy were small and contained but little if any colloid. Vascularization of the gland was extensive.—F. S. H.

Case of migraine cured by THYROID treatment (Sur un cas de migraine guéri par le traitement thyroïden). Parhon (C. J.) & Hortolomei (N.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1919, **1**, 68-70.

The administration of 0.025 grams of thyroid substance every other day produced an improvement in the disorder mentioned in the title.—F. S. H.

Anatomical and pathological studies of the THYROID in the affective psychoses (Récherches anatomo-pathologiques sur la glande thyroïde dans les psychoses affectives). Parhon (C. J.) & Stocker (Alice), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1920, **2**, 15-42.

A total of 9 cases is described in some detail. The general results of the observations indicate to the authors that the thyroid is frequently modified in the affective psychoses.—F. S. H.

Anatomical and pathological studies of the THYROID in chronic deliria (Récherches anatomo-pathologiques sur la glande thyroïde dans les délires chroniques). Parhon (C. J.), & Stocker (Alice), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1920, **2**, 49-56.

Histological studies of the thyroids from 6 insane patients. All of the glands showed abnormal cell pictures.—F. S. H.

Histological studies of the THYROID in the insane (Observations histopathologiques sur la thyroïde chez les aliénés). Parhon (C. J.) & Stocker (Alice), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 104-111.

A series of cursory observations.—F. S. H.

The relative frequency of lipoid granulations in the cells of the THYROID in different pathological conditions (Sur la fréquence rélative des granulations lipoïdes dans les cellules thyroïdiennes

dans différents cas pathologiques). Parhon (C. J.) & Stocker (Alice), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 154-155.

The authors found constant increase of lipoid granules in the thyroid in senile dementia.—F. S. H.

(THYROID) Exophthalmic goiter in pregnancy (Consideraciones sobre un caso de bocio exoftálmico y embarazo). Pasman (F. R.) & Mestre (R.), Semana méd. (Buenos Aires), 1921, **28**, 435-437.

A case of exophthalmic goiter in pregnancy is described, with improvement in symptoms following delivery. The relationship between exophthalmic goiter and pregnancy is not clear. In some instances, pregnancy is favorable to the course of the disease; in others, pregnancy has no influence; while in still others, pregnancy is of distinct harm. Exophthalmic goiter is not often seen in pregnancy. Halliday found 1 case in 1500 women; Bonnaire, 1 in 1000 women; Peralta Ramos, 1 in 12,000; Pasman found it still more rare. In the Rawson Hospital a single case was seen in ten years. However, the apparent rarity of exophthalmic goiter in pregnancy may to an extent be explained by the tendency of the obstetrician to overlook the larval forms of the disease which are mistaken for hysteria, neurasthenia, and the like. At times pregnancy may be the exciting cause of exophthalmic goiter. This is probably due, first, to a deviation of the physiological hyperfunction of the ductless glands, especially the thyroid, and, second, to the toxemia of pregnancy. A larval form of the disease may occasionally be whipped up into an outspoken manifestation of the syndrome by pregnancy.

—I. B.

(THYROID) Goiter. Pern (S.), N. York M. J. [etc.], 1922, **115**, 409-413.

According to Pern, exophthalmic goiter is only the extreme degree of thyrotoxic goiter. Goiter, with signs of hypo- or hyperthyroidism, is in each case a hypertrophy to meet some demand. This demand, a basic cause, is toxemia. The type of goiter, in turn, is markedly influenced by calcium and iodine deficiencies or excesses. Colloids depend upon calcium for their high viscosity. Iodine added to a colloidal gel beyond a certain point reduces its rigidity; sufficient will liquefy it. If sufficient iodine is added to a colloid to prevent its setting and calcium lactate is added in quantity sufficient not only to precipitate all of the iodine as calcium iodide but also to combine in the form of colloid, it will again gel Goiter of the large type accompanied with hypothyroidism and **cretinism** are prevalent in limestone districts. Individuals living in such districts are literally saturated with calcium. The alleviation of this type of goiter is accomplished by the administration of iodine; hence, it would appear that **myxedema** results because of an accumu-

ation of colloid rich in calcium, which in the presence of iodine is rapidly absorbed owing to the antagonizing action of the iodine to the calcium and the consequent liquefaction of the colloid. In districts where the water is free from calcium, goiter is prevalent, but it is marked by symptoms of hyperthyroidism. Women of such districts are prone to severe post-partum hemorrhages and delayed coagulation time of the blood. This condition can readily be corrected by the administration of calcium lactate. Goiters of calcium free water districts are usually small, extremely vascular, free from colloid, and are associated with symptoms of hyperthyroidism and increased blood iodine. Treatment with iodine preparations increases the symptoms. It therefore appears that in the presence of infection or intoxication that the thyroid gland hypertrophies; the type of hypertrophy depends upon whether the body colloids show a preponderance of calcium or iodine.—H. W.

(THYROID) Severe Basedow's DIABETES with diabetic coma (Note sur un cas de diabète grave basedowien avec coma diabétique). Popovici (C.) & Ionescu (A. St.), Bull. et mém. Soc. neurol., psychiat. et psychol. de Jassy, 1921, **2**, 156-158.

Case of Basedow's disease which had been treated with intensive radiation. This was followed by diabetes from which the patient died. The appearance of the diabetes coincided with the regression of the goiter.—F. S. H.

(THYROID) Surgical treatment of goiter. Quay (J. E.), Texas State J. M. (Ft. Worth), 1922, **18**, 208.

A summary of the classifications and treatment of toxic thyroids, as practiced at the Mayo Clinic.—C. R.

(THYROID) Substernal goiter, with pressure symptoms. Ratchford (B. K.), Tr. Ass. Am. Physicians (Phila.), 1920, **35**, 258-262.

See Endocrinology, 1921, **5**, 521.

(THYROID) The frequency of Basedow's disease in Vivarias (Fréquence du syndrome de Basedow dans le Vivarias). Regnault (F.), Bull. Acad. de méd. (Par.), 1921, 3, s. **85**, 193-195.

Regnault comments on the relative frequence of occurrence of the Basedow syndrome in Vivarias (a province south of Lyons, France). Females already possessing a simple goiter constitute the majority of patients. Goiter is still endemic in that region, though to a lesser extent than was the case 20 years ago. The Basedowian syndrome follows one or more pregnancies or an emotional strain. A number of instances resulted from the recent war conditions. The chief manifestations are an increased force of the heart impulse with tachycardia, tremor, a changed expression, and a brilliancy of the eyes, but there is no exophthalmos. There is also diminished capac-

ity for work, insomnia, restlessness, and irritability. Metrorrhagia is common. The development of toxic symptoms in these persons seems to be instigated by their excitable, impulsive temperament.
—I. B.

HYPERTHYROIDISM in pregnancy. Robinson (A. L.), J. Obst. & Gynæc. Brit. Emp. (Lond.), 1922, **29**, 296-302.

A report of 15 cases of hyperthyroidism in pregnant women. The clinical picture, in general, is one of mild or atypical Graves' disease. These patients were originally treated as neurotic women made worse by the strain of pregnancy, but they obtained little improvement from bromides, iron, aperients, etc. Later, the association of prolonged lactation and deficient nutrition suggested calcium depletion as an important etiological factor, while certain of the clinical features (e. g., muscle cramps and increased nervous excitability) had a clear resemblance to tetany, which is itself a manifestation of **parathyroid** disease, and a common condition of pregnancy in some countries. On these grounds the author has employed parathyroid and calcium lactate in all cases, usually 1-10 gr. of the former and 20 gr. of the latter each night. He has permitted lactation in those patients who have not been seriously affected, and continued the treatment with calcium lactate, omitting the parathyroid. In the severer types he has forbidden lactation and given calcium and **pituitary** extract. The resutls are described as encouraging.—E. N.

(THYROID) Goiter summary. Rosser (C. M.), Texas State J. M. (Ft. Worth), 1922, **18**, 196.

The writer believes that surgery in uncomplicated colloid goiter is unwise except for relief of pressure or deformity, but advises early removal of all adenomatous goiters, which he says are potentially toxic. Hyperplastic goiter should always be operated upon and the use of the x-ray and radium should be regarded as an adjunct only to operative removal. He believes that it is unnecessary to deceive the patient concerning the operation, and that local anesthesia in the hands of a surgeon of sufficient tact and patience offers the ideal method.—Author's Abst.

(THYROID) Treatment of MYXEDEMA (Traitement du myxoèdeme). Sainton (P.), Progrès méd. (Par.), 1920, **35**, 409.

A discussion of thyroid opotherapy and adjuvant measures of treatment. Oral ingestion of thyroid extract is advocated as against injection methods of administration. In myxedema of syphilitic origin arsenicals are of course indicated. In children calcium preparations are at times of benefit. Opotherapeutic treatment is increasingly beneficial as the age at which the disorder appears is advanced.
—F. S. H.

(THYROID) Respiration in Graves' disease (La respiration des Basedowiens. Étudiée à l'aide des méthodes actuelles: masque de l'ech, spirométrie, radioscopie, etc.). Sainton (P.) & Schulmann (E.), Ann. de méd. (Par.), 1922, **12**, 174-188.

Studies of the respiratory rate and rhythm in patients with Basedow's disease. The results indicate that the polypnea, inferior thoracic expansion, diminished diaphragm incursion, lowered limit of voluntary apnea, and diminution of the respiratory capacity are the consequence of the disorder and not the result of a concomitant rhino-pharyngeal or pulmonary lesion. The oculo-respiratory reflex is positive.—F. S. H.

(THYROID) Hereditary and familial goiter and cervical sympathetic nerve paralysis (Gozzo e paralisi del simpatico cervicale ereditari e familiari). Samaja (N.), Riv. di patol. nerv. (Firenze), 1920, **25**, 284-297.

Three brothers were affected by goiter. One of these having unilateral anhidrosis married a woman with goiter and sympathic lesions. From this marriage six children were born, four having goiter and sympathic lesions, and one, a daughter, having myxedema and hypophyseal dystrophy; a nephew also had thyroid hypertrophy. Another of the three brothers had a healthy wife, but he had two sons with goiter and a third with manifest goiter, but with sympathetic involvement. The nephews, sons of the first of the brothers, all had large thyroids; the second daughter was unmarried; the third, who is epileptic with anhidrosis on the right side, had two sons with this hereditary goiter, and one of these with typical Bernard-Horner disease. Thus there were three generations with goiter; and at least two, and perhaps three, with sympathetic disorders. According to the author, this combination has not previously been reported.—P. M. N.

Proteinogenous amines in the THYROID (Uber das vermutliche Vorkommen von proteinogenen Aminen inder Schilddrüse). Sammartino (U.), Biochem. Ztschr. (Berl.), 1922, **131**, 219-225.

An exhaustive attempt to obtain proteinogenous amines from fresh thyroid tissue failed to give any evidence that such compounds occur there naturally.—F. S. H.

The glucose mobilization rate in HYPERTHYROIDISM. Sanger (B. J.) & Hun (E. G.), Arch. Int. Med. (Chicago), 1922, **30**, 397-406.

Ten normal controls and ten well marked cases of **exophthalmic goiter** were studied under identical conditions. Carbohydrate utilization was computed from studies of the blood sugar, the respiratory quotient and the total metabolism, before and after glucose injection. The blood sugar curves in the control cases were entirely normal, while those in the cases of hyperthyroidism, for the most

part, showed the usual variation—an abnormally high peak maintained over a prolonged period. The respiratory quotients in the normal cases revealed normal carbohydrate storage and response, while those in the cases of hyperthyroidism showed a greater and more rapid rise, which made for a striking increase in the carbohydrate utilization. In cases of hyperthyroidism there is a deficiency in the ability to store carbohydrate. This makes for a carbohydrate plethora and this stimulates carbohydrate metabolsim. This inability to store glucose is probably a failure of **liver storage,** due to some toxic change in the liver caused by the disease.—H. L.

(THYROID) Increase of goiters (Zunahme der Strumen). Schick, Wien. klin. Wchnschr., 1922, **35,** 663.

A short note. In Vienna the number of goiters has been recently increasing. Klinger's idea of compelling the school children to take very small quantities of iodine is an excellent preventative measure and is recommended also in Vienna.—J. K.

Hyperplasia and hypersecretion of the THYROID in children (Hyperplasie und Hypersekretion der Schilddrüse bei Kindern und Jugendlichen). Schlesinger (E.), Ztschr. f. Kindhk. (Berl.), 1920, **27,** 207-230.

In regions of endemic goiter the author finds that new born infants often show a transient hyperplasia of the thyroid. This subsides in a few months. A second wave of thyroid enlargement appears in girls at 6 or 7 and in boys at 9, reaching its height before or during puberty. The thyroid enlargement is usually due to hyperplasia rather than to a nodular growth. About one-sixth of the boys and one-third or more of the girls show cardiovascular disturbances, though severe intoxication is rare. The children with this mild hyperthyroidism usually show a mental and physical development in advance of their years. The sexual development in the girls is likewise advanced.—C. H. G.

(THYROID) Pathology of goiter. Scott (A. C.), Texas State J. M. (Ft. Worth), 1922, **18,** 200.

Scott calls attention to the fact that there is no distinguishable pathological difference between toxic and non-toxic adenomas of the **thyroid,** and that there are no pathological findings in toxic adenomas indicative or corresponding to toxicity, while there are distinct differences in the pathology, symptomatology and physical findings as between cases of toxic adenoma and exophthalmic goiter.

—C. R.

(THYROID) Changes in the muscles in myxedema and myotonia atrophica (Beiträge zur Kenntniss der Muskelveränderung bei Myxodem und Myotonia atrophica). Slauck (A.), Ztschr. f. d. ges. Neurol. u. Psychiat. (Berl. u. Leipz.), 1921, **67,** 276.

Heidenhain has described certain changes of fibrous nature in the muscles in myotonic dystrophy which are analogous to those found in the musculature of congenital myxedema. The electrical excitability of the muscles from each disorder is also similar. In myxedema there is a high grade lowering of the irritability, the same is true of myotonia. On account of these similarities the "Kuprevidin" treatment of myotonia is indicated.—F. S. H.

(THYROID) Special disorders of the heart from goiter. Sloan (E. P.), Illinois M. J. (Chicago), 1918, **33**, 152.

Pressure symptoms with circulatory disturbances from pressure on the blood vessels in the neck were present in 30% of the operative goiter cases. Other disturbances that were observed as traceable to the goiter were: endocarditis, premature contractions, auricular flutter, auricular fibrillation and myocarditis. Removal of the goiter benefits or cures these conditions when it has caused them. Heart-block and defects in transmission of impulse are not caused by goiter and are not benefited by removal of goiter that may be present.
—F. S. H.

(THYROID) Some ways of using the electric current in exophthalmic goiter. Solis-Cohen (S.), Am. J. Electrotherap. & Radiol. (N. Y.), 1921, **39**, 59-66.

The pathogenesis, clinical aspects and a few measures in electrotherapy of exophthalmic goiter are briefly discussed. Since all cases of Graves' disease differ, no two patients can be treated alike; moreover, in no patient will a given therapeutic measure produce good results from beginning to end. There are two types of patients with exophthalmic goiter: first, those highly toxic, with marked thyroid activity, occasional fever, marked cardiac and nervous excitement and very high blood pressure; second, the milder type which is more sluggish in its evolution. Between these two extremes are the various gradations commonly met with. In treatment, rest is the first requisite, followed later by electricity. Autocondensation is a useful adjunct in management of high blood pressure; 200 to 300 milliamperes are administered for 20 minutes daily, or less often according to circumstances. In the milder cases, the static spark or the effleuve from the resonator is applied over the gland or alternately first on the one side, then on the other, of the seventh cervical vertebra when the enlargement is bilateral, or over the one side when the enlargement is unilateral. The application may be made both to the gland and over the vertebra by the use of a metal ball on a grounded strand. The strength of the current depends upon the subjective reaction, stopping short of great discomfort, and the skin over sites of application must present an erythematous reaction. The spark gap between the Leiden jars should be from one-quarter to two inches as desired, with an electrode of wood or brass placed either in contact with or at some dis-

tance from the skin over the gland, depending upon subjective and objective results. Galvanism, 5 to 10 milliamperes modified by the sinusoidal apparatus (60 to 90 interruptions per minute) placed over the side of the seventh cervical vertebra for 3 to 20 minutes, according to indications, is useful. Faradism may be combined with galvanism in the sinusoidal apparatus. The sinusoidal treatments may be first given in recent cases, the static in cases of longer duration. The old fashioned, simple galvanism is also useful, with the anode over the cervical sympathetic or the vagus, sometimes over the thyroid, the cathode over the sternum. In sluggish cases iodine ionization may be given; the cathode being placed over a pad moistened with a solution of potassium iodide or sodium iodide. Iodine ionization, however, should be employed only in cases in which the element of hyperthyroidism in the Graves' syndrome is absent, and the nervous symptoms are mild. The treatment of exophthalmic goiter may become surgical only when diagnosis is belated, in which instances there may be extreme pressure symptoms or a very great degree of hyperthyroidism. Even under such conditions in patients skillfully operated upon the essential autonomic and general endocrine disorder still persists, requiring appropriate nonsurgical management. In exophthalmic goiter treatment is nonsurgical in 90% to 95% of cases. Individualization is the keynote in treatment. In this protracted illness no case should be undertaken for treatment unless the patient consents to remain under observation for at least six months.—I. B.

(THYROID) Goiter. Stanton (J.), Boston M. & S. J., 1921, **184**, 693-696.

Brief general review.—H. W.

(THYROID) Experimental studies of the hypothetical relation between Basedow's disease and tuberculosis (Récherches expérimentales sur les relations hypothétiques entre la maladie de Basedow et la tuberculose). Steck (H.), Schweiz. med. Wchnschr. (Basel), 1921, **51**, 535-538.

Although there may occur a gross similarity in symptomatology of the two diseases under investigation Steck fails to find experimental evidence of a common etiology. By the administration of graduated doses of **adrenin**, plus the blood plasma from patients with Basedow's disease and from others with tuberculosis, to eviscerated guinea-pigs deprived of the central nervous system an analysis was made possible which demonstrated that in the majority of cases of the former disease there could be found evidence of the presence in the blood of substances of thyroid origin, while the tubercular cases furnished no such evidence. The blood from the patients with Basedow's disease augmented the constriction of the blood vessels obtained with adrenin. The blood of the tuberculous patients had no reenforcing action.—F. S. H.

(THYROID) Technic of goiter operation (Zur technik der Strumektomie). Streiszler, Wien. klin. Wchnschr., 1922, **35**, 664.

The author recommends that both lobes be removed and that the operation be started at the isthmus. No ligation of the large vessels is made.—J. K.

Radium emanations in exophthalmic goiter. Blood vessels of adenomas of THYROID. Terry (W. I.), J. Am. M. Ass. (Chicago), 1922, **79**, 1-3.

Including a former report, Terry brings his series of cases treated by radium emanation up to 33. Only patients with an extreme degree of hyperthyroidism were included; and this method of treatment was used only with the idea of converting them into better risks for major surgical procedures. Capillary tubes containing radium emanation were inserted into the substance of the thyroid gland, using local anesthesia. The ensuing pathologic changes are described. Final results are reported in 16 cases. Two were cured by radium emanation therapy alone; 10 were cured after resection; 4 died from two days to nine months after resection, 2 of them from hyperthyroidism. Experimental work on the anatomy of the blood vessels of thyroid adenomas is also reported in brief. The frequency of hemorrhage in adenomas is attributed to the weak walls of the intracapsular veins.—W. M. A.

(THYROID) The influence of THYROXIN on alcoholic fermentation (Ueber den Einfluss des Thyroxins auf die alkoholische Gärung). Tomita (M.), Biochem. Ztschr. (Berl.), 1922, **131**, 174-177.

The addition of thyroxin to mixtures of yeast and glucose resulted in an acceleration of the fermentative processes.—F. S. H.

Hen-feathering induced in the male fowl by feeding THYROID. Torrey (H. B.) & Horning (B.), Proc. Soc. Exper. Biol. & Med. (N. Y.), 1922, **19**, 275-279.

The results of the experiments as given in the title did not occur in castrated males and hence it appears that the appearance of hen-feathering in normal males when fed thyroid is dependent on the presence of lutear cells.—F. S. H.

Two cases of acute suppurative THYROIDITIS (Deux cas de thyroïditie aigue suppurée). Tourneux (J. P.), Progrès méd. (Par.), 1920, **35**, 371-372.

Cases are cited in which the inflammation is induced in glands primarily healthy and not complicated by goitrous degeneration. In the first case Eberth's bacillus was isolated in pure culture; in the second, pneumococcus and streptococcus were found.—F. S. H.

(THYROID) Mongolian idiocy in a Chinese boy. Tumpeer (I. H.), J. Am. M. Ass. (Chicago), 1922, **79**, 14-16.

This case, presented in detail and illustrated, is stated by Tumpeer to be the first reported occurring in any but the Caucasian race The findings are typical, including the recently noted changes in the sella turcica. The basal metabolic rate was within normal limits.
—W. M. A.

The rôle of heredity in THYROID pathology. Vallery-Rodot (P.), Lancet (Lond.), 1922, i, 24-26.

A discussion of heredity in disorders of the thyroid gland together with the presentation of several cases. There is very frequently a strong hereditary or a familial tendency to abnormal thyroid function. These tendencies are described as being "similar" or "dissimilar," that is, the child may inherit a tendency to Basedow's disease when the mother has it or he may have myxedema. Several members of a family are said to be affected frequently, some inheriting one type of disorder and others another type. There is often dysfunction of other endocrine glands in cases showing strong evidence of the congenital and familial factors. The author believes that the hereditary tendency to thyroid abnormality makes the gland more susceptible to attacks from syphilis, infectious diseases, intoxications, etc. He believes also that efforts at prophylaxis might be of great value if the hereditary element were worked out and the mother treated during pregnancy and lactation.—I. M.

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